A Buyer's Guide To Simulations For The Commodore 64

COMPUTE!'s GAZETTE

$3.00
December 1986
Issue 42, Vol. 4, No. 12
02220 $4.25 Canada

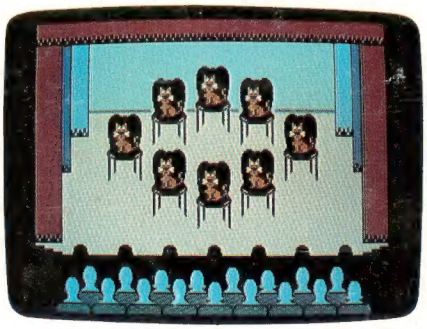
FOR **COMMODORE** PERSONAL COMPUTER USERS

128 Quicksort

Sort at lightning speed on the Commodore 128 with this machine language routine that utilizes the fastest sorting method for most applications.

Power BASIC: Program Mis-Matcher

Compare BASIC programs or source code files with this short, handy utility that sends the results to your screen or printer. For the 128, 64, Plus/4, and 16.

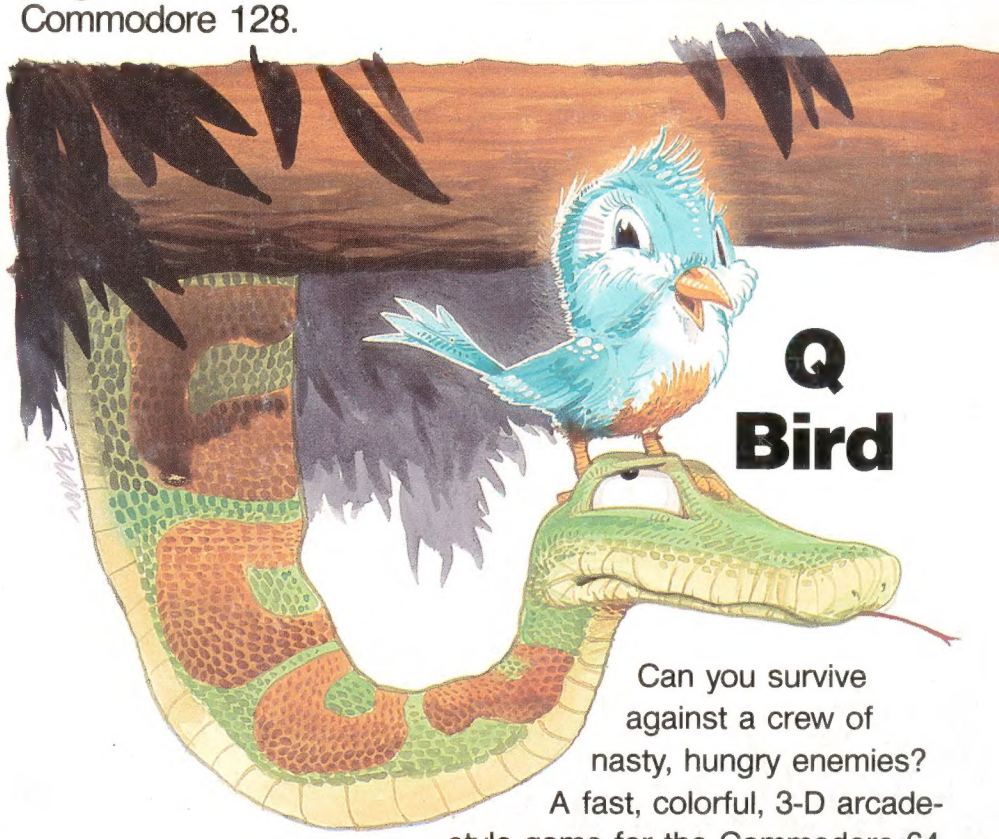


The Animals' Show

Write your own songs and then let the animals perform them. A delightful program for the Commodore 128.

Also In This Issue:

- Fast Hi-Res Screen Dump for Epson, Gemini, and compatible printers
- User Group Update
- Sprite Locater
- Software Reviews
- And More



Q Bird

Can you survive against a crew of nasty, hungry enemies? A fast, colorful, 3-D arcade-style game for the Commodore 64.

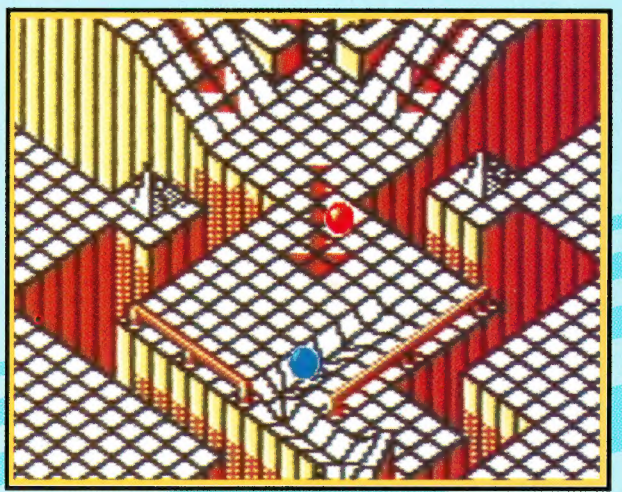
0 71486 02220 12

Go Ahead, Lose Your Marbles . . .

MARBLE MADNESS™

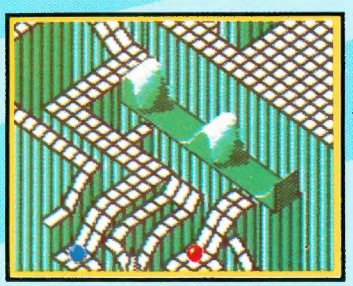
is Here !!!

The game that drove you crazy at the arcades now comes home. Same exciting gameplay, same blow-away graphics, sounds and music. We've even added an incredible all-new secret level.



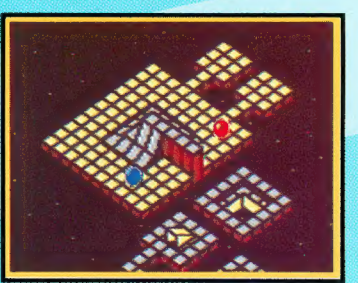
A unique game experience that's crazy fun for everyone. Two players race to the goal line, or one player races against the clock. It's sports competition, kinetics and strategy.

Ultimate Competition for 1 or 2 players.
The object is simple. Race your marble to the goal line, and don't let anything get in your way. It sounds easy, but it just might drive you nuts.



Spectacular Animation
Fantastic 3-D terrains are the raceways. Zany (but dangerous) enemies await your every turn. Avoid the deadly steelies and the pounding hammers. Watch out for the hungry marble munchers. Even surf a mechanical wave!

Secret Level
If you can find it, just wait till you try to get through it!



Incredible Madness
Marble Madness, the ultimate in exciting non-stop action. Each level has its own "personality" and creatures to contend with, as well as its own original music score. It's not easy being a marble – make it to the Ultimate Level and you'll know why.

ELECTRONIC ARTS™

How to order: Visit your retailer. If you are unable to find the product at your local retailer, you can call 800-245-4525 for direct VISA or Mastercard orders (In CA call 800-562-1112). The direct price is $29.95 for the Commodore version. Amiga version is $49.95. Apple, Atari and IBM versions coming soon. To buy by mail, send check or money order to Electronic Arts Direct Sales, P.O. Box 7530, San Mateo, CA 94403. Add $5 for shipping and handling ($7 Canadian). Allow 4 weeks for delivery. There is a 14-day, money-back guarantee on direct orders. For a complete product catalog, send 50¢ and a stamped, self-addressed envelope to Electronic Arts Catalog, 1820 Gateway Drive, San Mateo, CA 94404. Commodore and Amiga are registered trademarks of Commodore Business Machines. Apple is a registered trademark of Apple Computer. IBM is a registered trademark of International Business Machines, Inc. Marble Madness® 1984, 1986 Atari Games Corporation and Electronic Arts.

Screen shots represent Commodore 64 version. Others may vary.
Marble Madness is a registered trademark of Atari Games Corporation.

COMMODORE CLASSICS!

PAPERCLIP WITH SPELLPACK

for the Commodore 64

"The #1 Best Selling Word Processing Package."
— BILLBOARD'S COMPUTER SOFTWARE CHART

"Superb . . . the most sophisticated to date."
— COMPUTE MAGAZINE

"The best professional word processor available."
— RUN MAGAZINE

- *Fast: Insert/Delete, Move or Copy words, phrases, sentences or entire blocks of text.*
- *Easy: save up to 52 repetitive words or phrases, then enter them with just two keystrokes.*
- *Sophisticated: Global Search and Replace changes every occurrence of a wrong word or phrase.*
- *Works with the Consultant Data Base Manager for the C64.*
- *Personalized form letter, mailing list and mailing label functions.*
- *Built-in Spellpack with Dictionary for fast error checking.*

THE CONSULTANT

for the Commodore 128/64

Database management made easy!

"Combines simplicity with speed and gigantic records."
— COMMODORE MAGAZINE

- *Built-in templates for the most-needed database functions: Inventory, Budgets, Mailing Lists, Catalogs and many more.*
- *Extensive macro capability*
- *Keyed field access speed — 1/10 second; sorting speed — 4 seconds per 1000 records.*
- *Six search operators — Equal To, Greater Than, Less Than, Not Equal To, Match Anywhere, Wild Card.*
- *Totally flexible relational reporting — insert any Consultant datafile in a report.*
- *Works with PaperClip Word Processor.*

KEYS TO TYPING:

for the Commodore 64/128

40 words a minute in 32 easy lessons — or less!

Learn to type at your own pace!

- *32 step-by-step lessons to reach at least grade 10 proficiency!*
- *Lessons based on proven instructional techniques used by typing teachers.*

BATTERIES INCLUDED, an ITM company, 30 Mural Street, Richmond Hill, Ontario, Canada, L4B 1B5 (416)881-9941, Customer Information (416)881-9816. If you can't find this product at your local retailer, you may order it direct from us at the full suggested list price plus $5.00 for postage and handling. For product orders please call 1-800-387-5707 (U.S. only). For most Batteries Included products you can always have the latest version of your program by returning the original disk and $10.00. Write to us for our full color catalog of products for the APPLE, APPLE MACINTOSH, ATARI, ATARI ST, COMMODORE, COMMODORE AMIGA, AND IBM SYSTEMS.

©1986 Batteries Included. APPLE, APPLE MACINTOSH, ATARI, ATARI ST, COMMODORE, COMMODORE AMIGA, AND IBM are registered trademarks respectively of APPLE COMPUTERS INC., ATARI CORPORATION, COMMODORE BUSINESS MACHINES INC., AND INTERNATIONAL BUSINESS MACHINES INC.

*US SUGGESTED LIST PRICE. RETAILERS MAY SELL FOR LESS.

BATTERIES INCLUDED

PAPERCLIP II:

NEW! Only $79.95*

for the Commodore 128

"An exceptional value . . . one of the best software investments now available for the C128!"
— RUN MAGAZINE

The #1 best-selling word-processor, re-designed to take full advantage of the C128's increased memory, speed and power. Compatible with C-64 PaperClip text files.

- *Integrated 38,000-word spelling checker to give you error-free documents.*
- *Built-in telecommunications module to access on-line services — one toggle moves you between word processor and terminal.*
- *Works with* **THE CONSULTANT** *for the C128.*
- *New editing features include multiple columns, reverse video scroll and chaptering, with maximum document size now expanded to 999 lines.*

CALKIT

for the Commodore 64/128

". . . the very best program of its type . . . a powerful tool that's not overpowering . . . the perfect spreadsheet for the home user."
— COMPUTER ENTERTAINER NEWSLETTER

- *Simplified, streamlined spreadsheet program with "What If?" capability for projections and estimates.*
- *Built-in application templates: Check Book, Budget, Installment Payment, Income Tax, Balance Sheet, Stock Portfolio, Materials Estimator, and many more.*
- *Formats are already set up, calculations are pre-programmed — all you need do is enter data.*
- *Design your own customized worksheets to solve specialized problems.*

HOMEPAK

for the Commodore 64/128

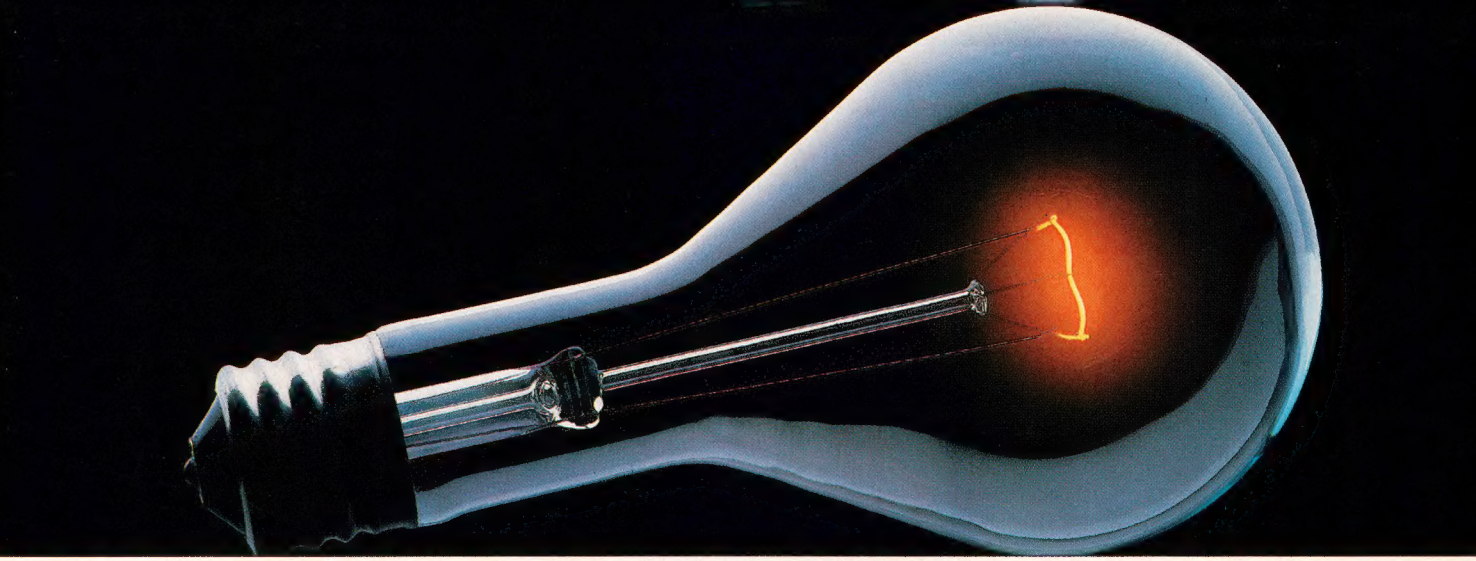
". . . inexpensive, powerful, integrated software. As such, HomePak is the winner of InfoWorld's Best Buy Award."
— INFOWORLD MAGAZINE

. . . one of the finest values on the market. Performance: excellent. Value: excellent."
— FAMILY COMPUTING MAGAZINE

Three easy-to-use programs on one disk:

1. *HOMETERM TELECOMMUNICATIONS*
   - *Powerful Macro facility — log on to your favorite bulletin board or database with one command.*
   - *Flexible data handling — save incoming text to disk, edit it, print it.*
2. *HOMETEXT WORD-PROCESSOR*
   - *Over 20 full-screen editing and formatting features: move & copy, word-wrap, justification, automatic paging and many more.*
3. *HOMEFIND DATABASE MANAGER*
   - *Natural English-language data entry/retrieval system, for simplified electronic filing.*

All three HomePak programs work together so it's easy to transfer data and perform integrated tasks.



COMPUSERVE.
YOU DON'T HAVE TO KNOW HOW IT WORKS TO APPRECIATE ALL IT CAN DO.

You don't have to know about hardware. You don't have to know about software. All you have to know is that CompuServe is a computer information service. You subscribe to it. And in return, you have access to an incredible amount of information, entertainment, communications and services right at your fingertips.

Here are a few of the hundreds of things you can do with CompuServe.

COMMUNICATE

Even beginners can compose, edit, send and file messages the first time they go online with CompuServe's **EasyPlex™ Electronic Mail.** Friends, relatives and business associates—anywhere in the country—can stay in constant, convenient touch.

CB Simulator features 72 channels for "talking" with thousands of other subscribers throughout the country and Canada. The chatter is frequently hilarious, the "handles" unforgettable and the friendships hard and fast.

More than 100 CompuServe Forums welcome your participation in discussions on all sorts of topics. There are Forums for gourmet cooks, golfers, musicians, pilots, sailors and more, all designed to show you how easy and fun it can be to get the most out of your computer.

If you want to learn more about your computer system, CompuServe's at your service. Our **Users Forums** cater to specific computer makes and models, and offer information and expertise on many different types of machines. You'll find electronic editions of popular computer periodicals. You can even find free software.

And if you need answers to software questions, seek out a **Software Forum.** You can often find solutions quickly and easily online.

Bulletin Boards let you post messages where thousands will see them. Use our National Bulletin Board or the specialized bulletin boards found in almost every Forum.

HAVE FUN

You'll find all sorts of sports and entertainment trivia games, plus brain-teasing educational games. You can go it alone or compete against players from all over the country. Test your wits in the only online TV-style game show with real prizes. Then, when you're ready, go for the ultimate in excitement and get into one of our interactive space adventures.

CompuServe's **movie reviews** keep that big night at the movies from being a five-star mistake. **Soap opera updates** keep you up on all the latest turmoils and tragedies on your favorite daytime dramas.

For leisure-time reading and relaxing, look into the electronic editions of some of your favorite magazines, including OMNI On-Line.

SHOP

CompuServe's **ELECTRONIC MALL™** lets you take a coast-to-coast shopping spree without ever leaving home. It's an exciting and easy way to shop online, buying name-brand goods and services from nationally known merchants.

SAVE ON TRIPS

CompuServe's travel services let you control your own travel arrangements through the convenience of your personal computer. Scan flight availabilities on almost any airline worldwide. Find airfare bargains, then book your own flight online.

With CompuServe you've got direct and connecting schedules for national and international flights. Plus complete listings of over 28,000 hotels around the world.

MAKE PHI BETA KAPPA

When you run out of the answers at homework time, it's time to turn to CompuServe for the complete set of continuously updated encyclopedias that doesn't take up an extra inch of shelf space.

The College Board, operated by the College Entrance Examination Board, gives tips on preparing for the SAT, choosing a college and getting financial aid.

KEEP HEALTHY

HealthNet will never replace a real, live doctor—but it is an excellent and readily available source of health and medical information.

On a more personal note, **Human Sexuality** offers information on a variety of topics concerning this very important aspect of human behavior. Hundreds turn to it for honest, intelligent and candid answers.

BE INFORMED

CompuServe puts all of the latest news at your fingertips. Our sources include the AP news wire (covering all 50 states, plus national news), the *Washington Post,* the *St. Louis Post-Dispatch,* specialized business and trade publications and more.

Find out instantly what Congress did today, who finally won the game and what's happening back in Oskaloosa, with the touch of a button. And, our executive news service lets you tell us what to watch for. We'll electronically find, "clip" and file news for you...to read whenever you'd like.

INVEST WISELY

Our comprehensive investment help just might tell you more about the stock you're looking at than the Chairman of the Board already knows. (Don't know who the chairman is? Chances are, we can fill you in on that, too.)

CompuServe gives you complete statistics on over 10,000 NYSE, AMEX and OTC securities. Historic trading statistics on over 90,000 stocks, bonds, funds, issues and options. Five years of daily commodity quotes. Standard & Poor's. Value Line. And more than a dozen other investment tools.

SUPERSITE facilitates business decisions by providing you with demographic and sales potential information by state, county and zip code for the entire country.

The national business wire provides continuously updated news and press releases on hundreds of companies worldwide.

GET SPECIALIZED INFORMATION

Pilots can get personalized flight plans, weather briefings, weather and radar maps, etc. Entrepreneurs use CompuServe too for complete step-by-step guidelines on how to incorporate the IBM s of tomorrow. Lawyers, doctors, engineers, military veterans and businessmen of all types use similar specialized CompuServe resources pertinent to their unique needs.

So much for so little.

CompuServe makes the most out of any computer, and all you pay is a low, one-time cost for a Subscription Kit (suggested retail price $39.95). Usage rates for standard online time (when CompuServe is most active) are just 10¢ a minute.

In most major metropolitan areas you can go online with a local phone call. Plus, you'll receive a **$25.00 Introductory Usage Credit** with the purchase of your CompuServe Subscription Kit.

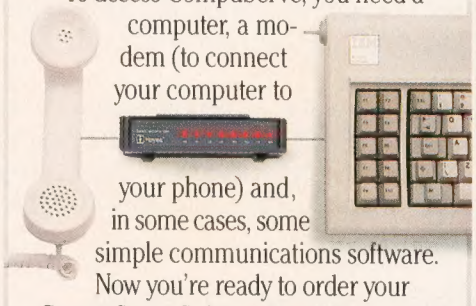
So easy the whole family can go online.

CompuServe is "menu-driven," so beginners can simply read the menus (lists of options) that appear on their screens and then type in their selections. Experts can skip the menus and just type in GO followed by the abbreviation for whatever topic they're after.

If you ever get lost or confused, just type in H for help, and we'll immediately cut in with instructions that should save the day. Plus, you can always ask questions online through our feedback service or phone our Customer Service Department.

Here's how to subscribe.

To access CompuServe, you need a computer, a modem (to connect your computer to your phone) and, in some cases, some simple communications software.



Now you're ready to order your CompuServe Subscription Kit.

For your low, one-time subscription fee, you'll receive:

- a complete, easy-to-understand, 170-page spiral-bound Users Guide
- your exclusive preliminary password
- a subscription to CompuServe's monthly magazine, *Online Today*

All this, plus:

- a $25.00 usage credit!

To order your Subscription Kit or to receive more information, call **800-848-8199** (in Ohio, 614-457-0802).

CompuServe Subscription Kits are also available in computer stores, electronic equipment outlets and household catalogs. You can also subscribe with materials you'll find packed with many computers and modems sold today.

CompuServe. You don't have to know how it works to appreciate all it can do—for you.

CompuServe®

Information Services, P.O. Box 20212
5000 Arlington Centre Blvd., Columbus, Ohio 43220

An H&R Block Company

EasyPlex and ELECTRONIC MALL are trademarks of CompuServe, Incorporated.

Your Ticket To The Best In Sports

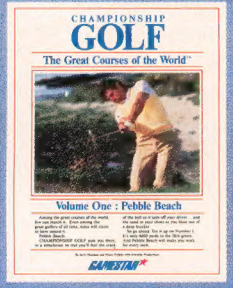
When was the last time you had the chance to attend a championship sporting event–or better yet, play in one? Gamestar's series of outstanding sports simulations gives you that chance. Make the playoffs. Play in the final round at Pebble Beach. Fight the heavyweight champ for the title.

Every Gamestar simulation is as real as the sport itself, from gameplay to strategy to graphics. So winning the championship won't be easy. If it was, it wouldn't be worth it.

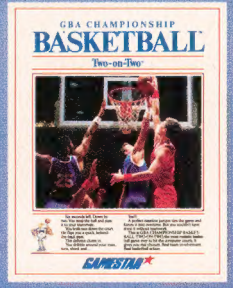
For the very best in sports–the excitement, the challenge, even the championship–Gamestar is your ticket.

Ask your retailer about our HOT HOLIDAY OFFERS worth $245.

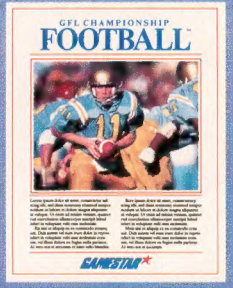
GAMESTAR



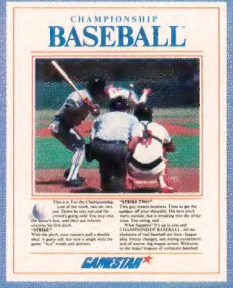
Available for IBM PC, PCjr and Tandy 1000, Commodore Amiga, and compatible computer systems. Coming soon for Apple II, Atari ST and compatible computer systems.



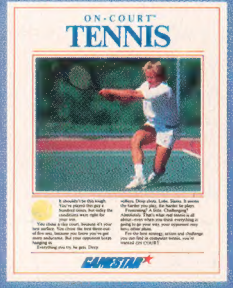
Available for Apple II, IBM PC, PCjr, and Tandy 1000, Commodore 64, 128, and Amiga, Atari ST, and compatible computer systems.



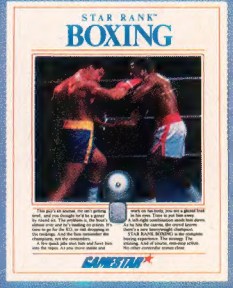
Available for Apple II, IBM PC, PCjr, and Tandy 1000, Commodore 64, 128, and Amiga, Atari ST, and compatible computer systems.



Available for Apple II, IBM PC, PCjr, and Tandy 1000, Commodore 64, 128, and Amiga, Atari ST, and compatible computer systems.



Available for Commodore 64 and 128 computer systems.



Available for Commodore 64 and 128 computer systems.

Gamestar is a trademark of Activision, Inc. Commodore 64, 128 and Amiga are trademarks of Commodore Electronics Limited. IBM is a trademark of International Business Machines Corporation. Tandy is a trademark of Tandy Corporation. Atari and ST are trademarks of Atari Corp. Apple is a trademark of Apple Computer. Activision is the registered trademark of Activision, Inc. © 1986 Activision, Inc.

GAZETTE contents

December 1986 Vol. 4, No. 12

features

Sophisticated Simulations *Selby Bateman*	**24**	*
A Buyer's Guide to Commodore 64 Simulation Software	**32**	*
The 64 as a Game Machine *Kathy Yakal and Selby Bateman*	**36**	*

reviews

Partner 128 *Ervin Bobo*	**90**	**128**
Mystery!* and *Castles and Creatures *Robin Minnick*	**91**	**64**
Fontmaster II *Richard H. Eldridge*	**92**	**64**
Vizastar 128 *Scott Thomas*	**97**	**128**
Nam *Neil Randall*	**100**	**64**
Ultimate Wizard *Neil Randall*	**101**	**64**

games

Q-Bird *Mike Sedore*	**46**	**64**
Moon Rescue *Edward E. Boughton*	**50**	**128**
Pegs *Jim and Deborah Chambers*	**52**	**64/+4/16/V**

education/home applications

The Animals' Show *Cullen O'Day*	**56**	**128**
Computing for Families: The Roots of Learning *Fred D'Ignazio*	**106**	*

programming

BASIC for Beginners: PRINT and INPUT *Larry Cotton*	**60**	**128/64/+4/16/V**
Video Setup, Part 1 *Jim Butterfield*	**66**	**64**
Fast Hi-Res Screen Dump *Robert F. Mills*	**70**	**128/64**
Sprite Locater *Stanley Brewster, Jr.*	**72**	**64**
Machine Language for Beginners: Customizing *Richard Mansfield*	**76**	**128/64**
Hints & Tips: Readable Listings	**80**	**128/64/+4/16/V**
Bar Charter *Raymond Jacob*	**82**	**64**
Sprite Graph *Chris Stoy*	**84**	**64**
128 Quicksort *Alton C. Williams*	**86**	**128**
Mastering 128 Sound and Music, Part 3 *D. C. Holmes*	**88**	**128**
Power BASIC: Program Mis-Matcher *Mark Jordan*	**108**	**128/64/+4/16**

departments

The Editor's Notes *Robert C. Lock*	**6**	*
Gazette Feedback *Editors and Readers*	**10**	*
User Group Update	**58**	*
Simple Answers to Common Questions *Tom R. Halfhill*	**102**	*
Horizons: One-Screen Programs *Todd Heimarck*	**104**	*
Bug-Swatter: Modifications and Corrections	**107**	*
News & Products	**110**	*

program listings

COMPUTE!'s Gazette Author's Guide	**122**	*
How to Type In COMPUTE!'s Gazette Programs	**123**	*
The Automatic Proofreader	**124**	**128/64/+4/16/V**
MLX	**125**	**128/64**
Advertiser's Index	**168**	*

*=General, **V**=VIC-20, **64**=Commodore 64, **+4**=Plus/4, **16**=Commodore 16, **128**=Commodore 128

COMPUTE!'s GAZETTE is published monthly by **COMPUTE!** Publications, Inc., 825 7th Avenue, New York, NY 10019 USA. Phone: (212) 265-8360. Editorial offices are located at 324 West Wendover Avenue, Greensboro, NC 27408. Domestic Subscriptions: 12 issues, $24 POSTMASTER: Send address changes to *COMPUTE!'s GAZETTE*, P.O. Box 10957, Des Moines, IA 50340. Second class application pending at Greensboro, NC 27403 and additional mailing offices. Entire contents copyright ©1986 by **COMPUTE!** Publications, Inc. All rights reserved. ISSN 0737-3716.

COMPUTE! Publications, Inc. is part of ABC Consumer Magazines, Inc., One of the ABC Publishing Companies: ABC Publishing, President, Robert G. Burton; 1330 Avenue of the Americas; New York, New York 10019.

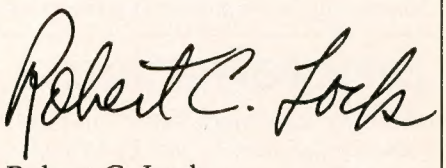
editor's notes

The numbers war crunches on. A recent editorial here was sharply critical of the historically unaggressive approach Commodore has been taking to the marketing of the Amiga. We continue to hope that Commodore will adopt a less passive stance and accelerate the sales of an otherwise very impressive machine. But, since we wrote that editorial, we've discovered a very interesting number. The *Software Industry Bulletin* (Vol. II, No. 38) reports that the preliminary prospectus filed by Atari recently (in its quest to go public) indicates that, as of June 30, 150,000 Atari systems had been sold. This conflicts with the numbers we had used as a basis for our previous editorial, and since these have been filed with the Securities and Exchange Commission, we must assume they are more reliable. Perhaps earlier estimates we had received included machines still in the pipeline or perhaps Atari was simply hopeful. In any event, the Atari ST at that time was outselling the Amiga, although not by the magnitude we then suspected. But, as we pointed out in an earlier editorial, Atari's sales included the European market, where Commodore had not yet begun selling the Amiga. Maybe *we'll* have to resort to passive vagueness for future numeric comparisons. Is it now quite perfectly clear?

At the recent Software Publishers Association meeting outside of Washington, D.C., industry insiders gave mixed reviews to the 64C. While many were favorably inclined toward *GEOS*, some were outspoken in questioning the need for it. Maybe we should describe it as an emperor's new clothes phenomenon, although in this case the new clothes are real and some are questioning the need for them. In any event, the 64 keeps selling and that is positive news for software vendors and for Commodore.

By the time you read this, we'll be just a couple of months away from the January Consumer Electronics Show, and just a few weeks away from COMDEX, the computer dealers' show. We're anxious to see what repositioning and other new clothes Commodore might have in store for the new year. We continue to feel it's a great bag of products; it's just that the delivering reindeer have grown a bit balky. Our wish list would include a continuance of the product foresight that has brought us all into one of the longest periods of product life we've seen in this industry *ever*. Maybe we'll leave more aggressive marketing of the Amiga on our list. Who knows *what* might happen. We'd like to see some exciting new recreational software (we're fudging on this one; we've previewed some of the new products advertised in this issue). And some exciting new software that's not recreational (again, we've peeked).

We continue to provide you with the very best in applications and coverage useful to you as a computer user. We're also pleased by your continued support and encouragement. Thank you. And until next time, enjoy your issue.



Robert C. Lock
Editor in Chief

One for all.

Affordable, Compatible, and Full-Color Capable!

Besides being the one printer for all the PC's pictured above, the OKIMATE® 20 is also the one for all your printing needs.

Want to spruce up your homework with colorful charts and graphs? The OKIMATE 20 is for you.

Need crisp "Near Letter Quality" printing for business correspondence? The OKIMATE 20 is for you.

Maybe you want expanded or fine print, italics, underlining, superscripts, or subscripts? You guessed it, the OKIMATE 20 is for you, too.

In fact, no matter what you have in your PC, you can put it on paper with the OKIMATE 20.

With this versatile printer you also get such high-end features as built-in type fonts, a 24-element printhead and the ability to make transparencies for overheads.

All at a very low-end price: $268* complete with "Plug 'n Print®" personality module.

For the name of the OKIMATE 20 retailer nearest you, simply call 1-800-OKIDATA.

*Suggested retail price. Dealer price may vary.

OKIDATA®
an OKI AMERICA company
We put business on paper.

Registered Trademarks: OKIDATA, Oki America, Inc.; Marque déposée, Oki America, Inc.; PLUG 'N PRINT, Oki America, Inc.; OKIMATE, Oki Electric Industry Company, Ltd.; Commodore and Commodore 64, Commodore Electronics, Ltd.; Apple, Apple Computer, Inc.; IBM, International Business Machines Corp.; Atari, Atari Inc. Trademarks: Amiga, Commodore-Amiga, Inc.; PCjr, International Business Machines Corp.

COMPUTE! Publications, Inc.
One of the ABC Publishing Companies

Publisher James A. Casella
Founder/Editor in Chief Robert C. Lock
Senior Editor Richard Mansfield
Managing Editor Kathleen Martinek
Executive Editor Selby Bateman
Editor Lance Elko
Assistant Editor Rhett Anderson
Production Director Tony Roberts

Editors
Tom R. Halfhill, Editor, COMPUTE!'s Atari ST Disk & Magazine; Stephen Levy, Editor, COMPUTE! Books Division; Ottis R. Cowper, Technical Editor

Assistant Editors
Gregg Keizer, Ann Davies (Books); George Miller, Dale McBane, (Technical); Philip Nelson (COMPUTE! Magazine); Todd Heimarck, (COMPUTE!'s Atari ST Disk & Magazine); Kathy Yakal, Assistant Features Editor; Tammie Taylor, Karen Uhlendorf, Copy Editors; Mark Tuttle, Submissions Reviewer

Editorial Programmers
Patrick Parrish (Supervisor), Tim Victor, Tim Midkiff

Programming Assistants
David Florance, David Hensley, Troy Tucker

Administrative Staff
Executive Assistant, Debi Nash; Julia Fleming, Iris Brooks, Mary Hunt, Sybil Agee

Production
Irma Swain, Production Manager; Janice Fary, Art & Design Director; Lee Noel, Assistant Editor, Art & Design; De Potter, Mechanical Art Supervisor; Terry Cash, Carole Dunton, Typesetting

Artists
Dabney Ketrow (Publications); Harry Blair, Illustrator

Associate Editors
Jim Butterfield (Toronto), Fred D'Ignazio (Alabama)

Customer Service
Diane Longo, Customer Service Manager; Orchid Tamayo, Dealer Sales Supervisor; Cassandra Greene, Customer Service Supervisor

Receptionist, Anita Armfield

Warehouse Manager, John Williams

President James A. Casella
Vice President, Advertising Richard J. Marino
Vice President, Finance & Planning Christopher M. Savine

Promotion
Caroline Dark, Promotion Assistant

Advertising Sales
Richard J. Marino, Vice President, Advertising Sales; Peter Johnsmeyer, Director of Advertising Sales; Bernard J. Theobald, Jr., Associate Advertising Director; Kathleen Hanlon, Production Coordinator

Sales Representatives

Jerry Thompson	415-348-8222
Lucille Dennis	415-348-8222
Andrew Eisenberg	212-887-8474
Harry Blair	919-275-9809

Address all advertising materials to:
Kathleen Hanlon, COMPUTE!'s GAZETTE
324 West Wendover Ave., Suite 200, Greensboro, NC 27408

Sales Offices

Northeast	212-315-1665
Mid-Atlantic	212-315-1665
Southeast	212-275-9809

Sales Offices, Jules E. Thompson, Inc.
1290 Howard Avenue
Suite 303
Burlingame, CA 94010

Midwest	312-726-6047
Texas	713-731-2605
Pacific Northwest	415-348-8222
Northern CA	415-348-8222
Southern CA	213-378-8361
Arizona	213-378-8361
New Mexico	213-378-8361
Colorado	303-595-9299

MPA
Member
ABC
Audit Bureau of Circulations

COMPUTE! Publications, Inc., publishes
COMPUTE! ***COMPUTE! Books*** ***COMPUTE!'s GAZETTE***
COMPUTE!'s GAZETTE Disk ***Apple Applications***
COMPUTE!'s Atari ST Disk & Magazine

Editorial Office:
324 West Wendover Ave., Suite 200, Greensboro, NC 27408

Corporate Offices:
825 7th Avenue, New York, NY 10019

Customer Service:
P.O. Box 5038, F.D.R. Station, New York, NY 10150
Telephone: (In NY) 212-887-8525;
(In U.S.) Toll free 1-800-346-6767
Office Hours: 8:30 AM to 4:30 PM Monday–Friday

Subscription Orders
COMPUTE!'s GAZETTE
P.O. Box 10957, Des Moines, IA 50340

TOLL FREE
Subscription Order Line
1-800-247-5470
In IA 1-800-532-1272

COMPUTE!'s GAZETTE
Subscription Rates

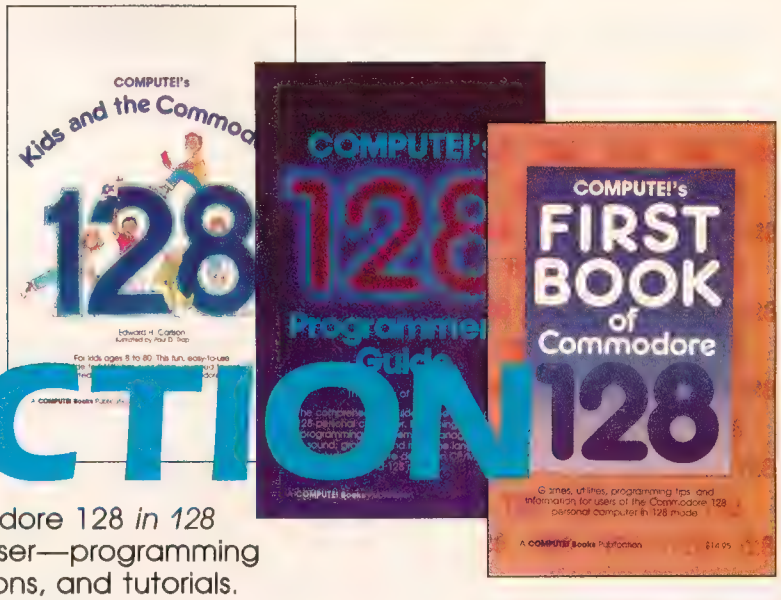
(12 Issue Year): US (one year) $24. Canada, Mexico and Foreign Surface Mail $30. Foreign Air Mail $65.

The COMPUTE!'s GAZETTE subscriber list is made available to carefully screened organizations with a product or service which may be of interest to our readers. If you prefer not to receive such mailings, please send an exact copy of your subscription label to: COMPUTE!'s GAZETTE, P.O. Box 10958, Des Moines, IA 50950. Include a note indicating your preference to receive only your subscription.

Authors of manuscripts warrant that all materials submitted to COMPUTE!'s GAZETTE are original materials with full ownership rights resident in said authors. By submitting articles to COMPUTE!'s GAZETTE, authors acknowledge that such materials, upon acceptance for publication, become the exclusive property of **COMPUTE!** Publications, Inc. No portion of this magazine may be reproduced in any form without written permission from the publisher. Entire contents copyright © 1986 **COMPUTE!** Publications, Inc. Rights to programs developed and submitted by authors are explained in our author contract. Unsolicited materials not accepted for publication will be returned if author provides a self-addressed, stamped envelope. Where programs are included in an article submission, a tape or disk must accompany the submission. Printed listings are optional, but helpful. Articles should be furnished as typed copy (upper and lowercase, please) with double spacing. Each article page should bear the title of the article, date, and name of the author. **COMPUTE!** Publications, Inc., assumes no liability for errors in articles or advertisements. Opinions expressed by authors are not necessarily those of **COMPUTE!** Publications, Inc. **COMPUTE!** Publications assumes no responsibility for damages, delays, or failure of shipment in connection with authors' offer to make tape or disk copies of programs published herein.

PET, CBM, VIC-20, Commodore 64, Plus/4, 16, and 128 are trademarks of Commodore Business Machines, Inc., and/or Commodore Electronics Limited. Other than as an independent supplier of quality information and services to owners and users of Commodore products, **COMPUTE!** Publications, Inc., is in no way associated with Commodore Business Machines, Inc., or any of its subsidiaries.

COMPUTE! Books' COMMODORE 128 COLLECTION



These outstanding books for the Commodore 128 *in 128 mode* contain something for every 128 user—programming guides, memory maps, games, applications, and tutorials. And all programs take full advantage of the 128's power: Each is used in 128 mode. All the listings are carefully tested, and the information is dependable and current. Plus, each book is written in COMPUTE!'s popular, easy-to-understand style to offer you hours of entertainment, education, and challenge.

Look for these titles at your local computer or book store, or order directly from COMPUTE! Books.

To order, call toll-free 1-800-346-6767 (in NY 212-887-8525), or write COMPUTE! Books, P.O. Box 5038, F.D.R. Station, New York, NY 10150.

COMPUTE!'s Kids and the Commodore 128

Edward H. Carlson
$14.95
ISBN 0-87455-032-7 275 pages

Over 30 sections—all with instructor notes, lessons, assignments, and lively illustrations—will entertain and amuse you as you learn about this powerful computer. For kids and adults alike.

128 Machine Language for Beginners

Richard Mansfield
$16.95
ISBN 0-87455-033-5 392 pages

A new edition of COMPUTE!'s bestseller, *Machine Language for Beginners*, this book includes everything needed to learn to program the 128 effectively: numerous programming examples, memory-management tutorials, and a dictionary of all major BASIC words and their machine language equivalents. Plus, there's a high-speed, professional-quality, label-based assembler that's both easy to use and full of special features that take full advantage of the extra speed and memory of the 128. *A disk is also available for $12.95 which includes programs in the book, 335BDSK.*

COMPUTE!'s 128 Programmer's Guide

Editors of COMPUTE!
$16.95
ISBN 0-87455-031-9 444 pages

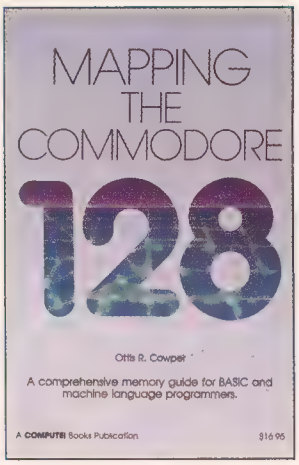
The complete guide to the Commodore 128, this book thoroughly explores BASIC 7.0; shows you how to create graphics, music, and program peripherals; and introduces you to machine language programming. A clear yet exhaustive reference and tutorial to the 128.

COMPUTE!'s First Book of the Commodore 128

Edited
$14.95
ISBN 0-87455-059-9 217 pages

Games, programs, and tutorials for the Commodore 128 exclusively in 128 mode that teach everything from how to create windows to programming sound and making disks autoload. There's even a map of all the important memory locations. *A disk is available for $12.95 which includes all the programs in the book, 599BDSK.*

New Release



Mapping the Commodore 128

Ottis R. Cowper
$19.95
ISBN 0-87455-060-2

This clearly written, comprehensive memory map and programmer's guide, by the technical editor of COMPUTE! Publications, provides a detailed explanation of the inner workings of the Commodore 128 computer. Topics include memory management, BASIC 7.0, I/O chip registers, the operating system, system RAM, and much more. This is an important reference for both BASIC and machine language programmers.

NC residents please add 5 percent and NY residents add 8.25 percent sales tax.
Add $2.00 shipping and handling per book or disk; $5.00 airmail.
Please allow 4–6 weeks for delivery.

COMPUTE! Publications, Inc. abc
Part of ABC Consumer Magazines, Inc.
One of the ABC Publishing Companies

COMPUTE! books are available in the U.K., Europe, the Middle East, and Africa from Holt Saunders, Ltd., 1 St. Anne's Road, Eastbourne, East Sussex BN21 3UN, England, and in Canada from McGraw-Hill, Ryerson Ltd., 330 Progress Ave., Scarborough, Ontario, Canada M1P 225.

Do you have a question or a problem? Have you discovered something that could help other Commodore users? We want to hear from you. Write to Gazette Feedback, COMPUTE!'s GAZETTE, P.O. Box 5406, Greensboro, NC 27403. We regret that due to the volume of mail received, we cannot respond individually to programming questions.

Separating Variables

I have seen PRINT statements that do not use semicolons between different sections (strings and variables mixed on one line). Does the semicolon cause an extra space? When is it necessary? Will these two lines print the same?

```
10 PRINT"HIGH SCORE="HS" YOUR
   RANK IS "R$
10 PRINT"HIGH SCORE=";HS;" YOUR
   RANK IS ";R$
```

Another question: Why do I see programs omit the closing quotation mark? Is this the same as reverse mode, which is canceled by a RETURN? Is there any problem with using this method in programs?

Denis H. Gregg

Semicolons first. The two examples do the same thing, as you'll see if you type them in. Semicolons are optional when you're alternating string literals and variables, at least in Commodore BASIC. Some other BASICs require the semicolons.

Semicolons are required when two variables are printed one after another. Run the following program to see how this works:

```
10 AB = 5: CD = 6
20 PRINT AB;CD
30 PRINT ABCD
```

In line 20, the variables are separated by a semicolon and values for both are printed. In line 30, the computer sees ABCD as a four-letter variable. Only the first two letters of a variable name are significant, so only the value for AB will be printed in this case.

The semicolons have nothing to do with the extra spaces you may have noticed with numeric variables. A positive number is printed with a leading space and is followed by a cursor right. The extra space is there to make room for a minus sign in front of the number, in case it's negative. The following program illustrates:

```
10 A = 5: B = -5
20 PRINT CHR$(34);A
30 PRINT CHR$(34);B
```

The positive number is preceded by a space, the negative number has a minus sign in front (with no space). By printing the CHR$(34), we put the computer into quote mode. The reversed bracket you see following each value is the quote mode equivalent of cursor right.

As you've noticed, reverse mode is canceled by a RETURN, as are quote mode and insert mode. The computer is in quote mode whenever an odd number of quotation marks have been typed. Insert mode is activated by pressing the shifted INST/DEL key one or more times. It's identical to quote mode, except that the unshifted INST/DEL key prints as a reverse T *in insert mode. It deletes characters in quote mode.*

Since RETURN cancels quote mode, the closing quotation mark is optional when you're printing a string. There's an exception, though. If the string ends with spaces, the spaces won't be printed to the screen. To make sure the trailing spaces appear, either end the string with a quotation mark or use shifted spaces (hold down the SHIFT key and press the space bar).

The only advantage to these two techniques is that by leaving out semicolons and closing quotation marks, you save a byte of memory here and there. Unless you're strapped for memory (the unexpanded VIC comes to mind), there's no advantage to using either technique.

Reliable Tape Loading

I own a Commodore Datassette. I often get load errors for no reason. When I list the program, it starts out okay, but then I get some strange-looking lines. Sometimes they have line numbers, but when I try to delete them, my computer locks up. Please help me with this problem.

Lyle Glass

Although cassette storage is generally very reliable, it isn't perfect. Here are some guidelines that can help you work around the errors.

• Try to load the program again. If this doesn't work, fast-forward to the end of the tape and rewind back to the beginning before you try again. This procedure helps tighten up the tape.

• Use ferric-oxide rather than chromium tapes. Chromium tapes are advertised as having better quality for sound recordings, but they require a stronger magnetic signal. Ferric-oxide tapes are better for recording computer programs. They also cost less.

• If you've had your Datassette for a while, the tape head may be dirty or magnetized. Using a head cleaner and demagnetizer—available at most record stores—may solve your loading problems.

• Try to use short tapes when you save programs. Tape players can have difficulty maintaining a constant speed with long tapes.

• It sometimes helps to move your Datassette away from your television and your computer's power supply, since they emit magnetism which can corrupt the data sent from the Datassette to your computer.

• To make sure you never lose a program, always save your important programs on two different cassettes.

If none of the above suggestions works, the tape may be damaged, or you may have accidentally saved another file over the end of the program. Try this after you get a load error. Type it in direct mode (without a line number), and do not press RETURN until you've typed all of it:

```
FOR X=45 TO 49 STEP 2:POKE X,PEEK
(831):POKE X+1,PEEK(832):NEXT
```

This may restore your program.

Ones AND Zeros

I have typed many programs on my Commodore 64 with lines like the following:

```
10 POKE 53265,PEEK(53265) AND 248
```

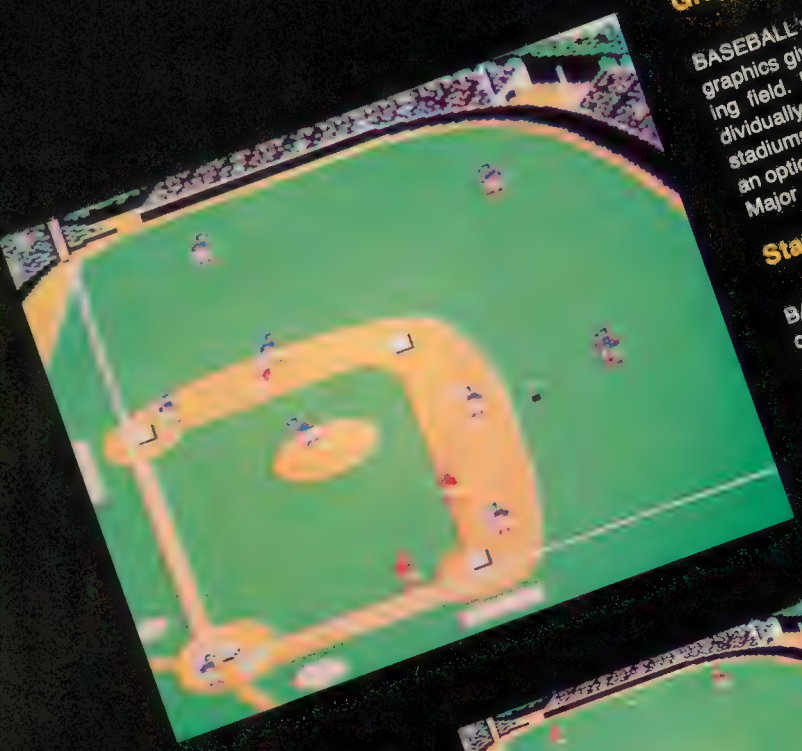
Could you please explain what the part after the comma does?

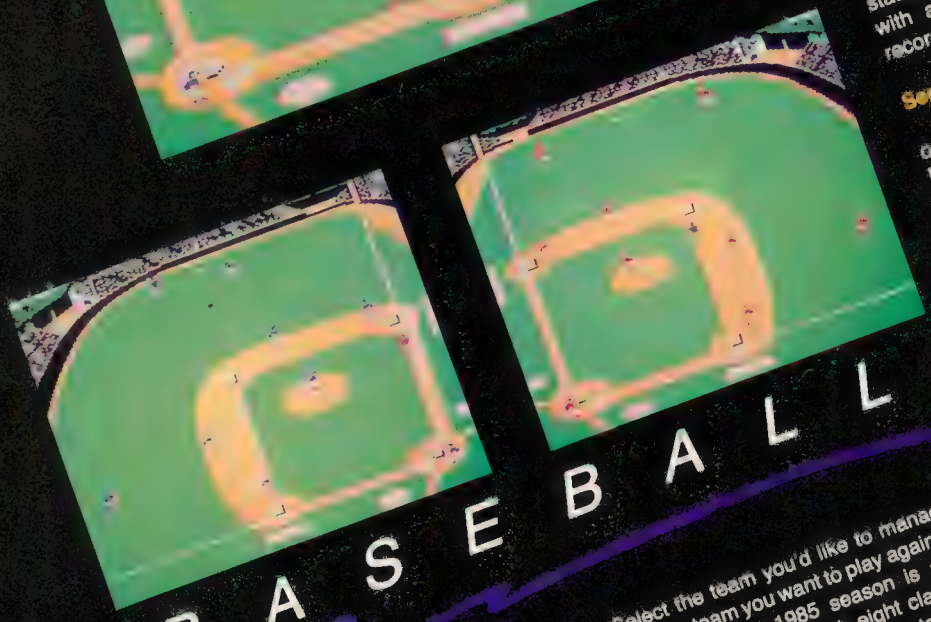
H. K. Miner

Many programs use AND in its most common use—as a boolean (logical) operator. You've seen it like this:

```
IF A>=10 AND A<=20 THEN PRINT
"IN RANGE!"
```

This statement prints out a message only if the variable A is within the range 10–20. Two conditions are tested: Is A





BASEBALL

From the author of FOOTBALL comes an incredibly sophisticated, realistic and complete statistical baseball simulation for one or two players. Game play, manager's functions, graphics, and a statistical library establish BASEBALL as the ultimate sports simulation program.

Game Play

BASEBALL's underlying statistical framework simulates the realities of baseball like never before. Within this framework, the program considers each player's batting statistics against both left-handed and right-handed pitchers, and pitchers statistics vs. left- and right-handed batters. Every player's fielding and base-running abilities are also considered (an important factor when attempting to steal a base, etc.).

Select the team you'd like to manage, then pick the team you want to play against. Every team from the 1985 season is accurately represented, along with eight classic teams from the past. Determine your starting lineup, designate a starting pitcher, and make player substitutions when necessary. You call the plays, offense and defense. In a one-player game, your computer opponent displays uncanny intelligence in reacting to your managing decisions.

Manager's Functions

Built-in manager's functions provide extra versatility. You can trade team players, draft new players, create your own team, even form your own league. The program's stat-tracker keeps track of your team's season statistics and individual player year-to-date stats.

Graphics

BASEBALL's highly-detailed animated graphics give you a perfect view of the playing field. Each player acts and moves individually on every play. Three different stadiums are included with the program, and an optional Stadium Disk lets you play in any Major League stadium in the United States.

Statistics

BASEBALL can maintain a complete statistical record of each team player's performance. All player stats and game Box Scores can be displayed on the screen or sent to an external printer for a hardcopy printout.

BASEBALL also includes a unique Auto-Play option that lets the computer play a complete game in less than three minutes. A whole series of games can be played unattended, and an entire season of player and team statistics can be compiled over several days with all game stats printed out for your records.

See Your Dealer...

or write or call for more information. BASEBALL is available on disk for the Commodore 64 and Commodore 128 computers. For direct orders please enclose $49.95 plus $2.00 for shipping and specify UPS or first class mail delivery. Visa, MasterCard, American Express, and Diners Club cards accepted.

Commodore 64 and Commodore 128 are trademarks of Commodore Electronics, Ltd.

MAJOR LEAGUE BASEBALL PLAYERS
MLB

© 1986 MLBPA

subLOGIC Corporation
713 Edgebrook Drive
Champaign IL 61820
(217) 359-8482 Telex: 206995

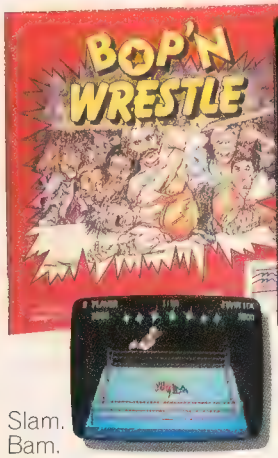
Order Line: (800) 637-4983
(except in Illinois, Alaska, and Hawaii)

There seems to be some disagreement as to which one of our Commodore® programs is the most fun.

Sometimes it's tough to make everybody happy all of the time. But that's not your problem.

Mindscape makes so many great Commodore® software titles you'll surely find at least one you have to get your hands on. Maybe two. Even three.

The choice is up to you. No holds barred.



Slam. Bam. With plenty of pow. *Bop 'n Wrestle™* puts you in the ring with a crazy collection of bone crushers. For one or two players, this first truly 3-dimensional combat sports simulation lets you climb, gouge, and claw your way to the top of the heap. Drop kicks, full nelsons, and the turnbuckle fly have never been this much fun before.

Be prepared to take evasive action. In *Infiltrator™* by Chris Gray, you're Captain Johnny "Jimbo Baby" McGibbits, ace chopper jockey. Your mission is no day at the races. When you make it through hostile enemy airspace, this realistic flight simulation converts to covert ground-based animated graphic adventure. Now just destroy the mad leader and his angry troops. Thumbs up!

Get ready to work some magic. *Spell of Destruction™* makes you a wizard's apprentice inside the Castle of Illusions. You must find and destroy the Prime Elemental. You're armed with a supply of spells and fireballs, but there are plenty of lessons to learn before you pass the Loremaster's challenging trial. Music and 3-dimensional graphics of 70 eerie locations make this adventure truly awesome.

Hoist a sail on your monitor. And sit down at the keys. *The American Challenge: A Sailing Simulation™* will make you a better sailor in a few short strokes. Race against the program, another skipper head-to-head, or via modem from coast-to-coast. When you've mastered the basics you're ready to meet the Aussies and reclaim The America's Cup. Set your sails and your sights on the waters of Silicon Bay.

Without question, this quest is for you. *Fairlight™* combines magic, adventure, strategy, and action as you meet the challenge to find the Book of Light. You're in a far away and ancient land. But 3-dimensional high-resolution graphics make it all seem real. This epic will grab you. Only the strong and resourceful will conjure up the courage it takes to survive.

Mindscape

Software that challenges the mind.

MINDSCAPE INC

Visit your retailer or call 1-800-443-7982 (in Illinois 1-800-654-3767) for VISA or MasterCard orders. To purchase by mail, send VISA or MasterCard number with expiration date, check or money order to Mindscape, P.O. Box 1167, Northbrook, IL 60065. Add $3.00 for shipping and handling. Allow 3-5 weeks for delivery. All of the above C64/128 products are $29.95 each.

If you're an attorney read this: Commodore is a registered trademark of Commodore Electronics Ltd. Copyright © 1986 Mindscape, Inc. Mindscape is a trademark of Mindscape, Inc. *Spell of Destruction* copyright © 1985 Softek International, Ltd. *Infiltrator* software copyright © 1986 Chris Gray Enterprises, Inc. Licensed in conjunction with International Computer Group. *Bop 'n Wrestle* copyright © 1986 Beam Software. All rights reserved. Licensed in conjunction with International Computer Group. *The American Challenge: A Sailing Simulation* is a trademark of Mindscape, Inc. *Fairlight* copyright © 1985/1986 *Bo Jangeborg and the Edge*. Licensed in conjunction with International Computer Group.

greater than or equal to 10? Is A also less than or equal to 20? There are four possibilities:

TRUE AND TRUE = TRUE
TRUE AND FALSE = FALSE
FALSE AND TRUE = FALSE
FALSE AND FALSE = FALSE

As you can see, the only time the whole thing is true is when both parts are true. If the statement were ***IF A>=10 OR A<=20****, then only one or the other (or both) would have to be true for the THEN to happen (as a matter of fact, this statement is always true; all numbers are either greater than 10 or less than 20). When you OR two statements, the result is true unless* both *statements are false.*

Now substitute ones and zeros:

1 AND 1 = 1
1 AND 0 = 0
0 AND 1 = 0
0 AND 0 = 0

The ones act like the true statements, and the zeros act like false statements. This is called a bit-wise AND.

If you were to PRINT PEEK(53265), you might see the number 27 appear on the screen, so location 53265 holds the value 27. These numbers are expressed in decimal notation (base 10), a numbering system that arose because people have ten fingers. Within a computer, however, it's easier to store numbers as binary (base 2) numbers. The only two binary numbers are 1 and 0, which might also be called on and off or true and false.

The value 248 looks like this in binary: 11111000. Using a bit-wise AND makes the resulting bit 1 only if the corresponding bits of both *values being compared are 1. So in the example you gave, the value 248 masks out the three lower bits from location 53265. These bits will be 0 in the answer, while all the other bits will take on the appropriate bit values from location 53265. Let's say location 53265 had the value 27 (binary 00011011).*

```
  00011011
AND 11111000
------------
  00011000
```

Why turn off individual bits? Within the memory of the 64 are a series of hardware registers which control the actions of the video chip, the interface chips, and various other chips. Some registers control a single function; location 53281 is a VIC chip register which determines the color of the screen, for example. But other registers, such as 53265, have several purposes. Sometimes you need to change just one or two bits in a certain location, but leave everything else the way it is. That's where bit-wise ANDing comes in.

In location 53265, the lower three bits control vertical fine scrolling. ANDing with 248 resets these bits to 000, canceling any previous scrolling without disturbing the setting of any other bits in the register.

If we wanted to turn on a bit, we'd use an operator similar to AND—the OR operator. With OR, the result is 1 if either (or both) of the tested bits are 1's. Let's say we had already performed the operation above and had the value 24 (binary 00011000) stored at 53265. Bit 5 (the sixth bit from the right) in that register controls whether or not the VIC chip is in bit-mapped mode. We could use an OR to turn that bit on.

```
  00011000
OR 00100000
------------
  00111000
```

The BASIC equivalent would be:

```
20 POKE 53265,PEEK(53265) OR 32
```

Problems With COLLISION

I have been trying to write a game program on my new 128, but I'm having trouble with the COLLISION command. It detects the first collision between two sprites; all subsequent collisions are ignored. I have enclosed a listing of my program.

James R. Rudolph

COLLISION is a rather unusual command. It's best described as a delayed GOSUB command. It puts the 128 in a state where, if a collision occurs, the computer finishes whatever command it is executing and then executes a GOSUB to the subroutine that handles collisions. In your program, the ***COLLISION1,3100*** *statement tells the computer to GOSUB 3100 whenever two sprites bump into each other.*

Because it's a GOSUB that starts the routine, the section that handles collisions should end with a RETURN. By the way, it's not necessary to turn off the COLLISION routine while the subroutine is working. Just be sure to end it with a RETURN (not a GOTO).

Copy-Protection Blues

I have a 1571 disk drive for my 64. I recently wanted to purchase a commercial program, which was marked "for the 1541 only" on the box. The store owner tried the game on a 128 with 1571 drive. The title screen came on, but after that the screen turned fuzzy. The program did not work. Is the 1571 not totally compatible with all 64 software?

Chad Cummings

I have an Enhancer 2000 disk drive and a friend has a 1541. All of my copy-protected games load and run on his drive with little or no problem, but many of them won't even load on my 2000. Do I have to buy a 1541 to run these special disks? What's the problem here?

Martin Ray

I have an MSD dual disk drive I use with the 64. Several software companies write software that apparently will run only on a 1541 disk drive. When I load such programs, I get the title screen and then the drive sets off for never-never land.

The MSD is a hardy drive and I don't relish the thought of buying a 1541 unless it's necessary. Thanks for your help.

Robert L. Garoutte

There are some programs that work only when a 1541 is connected to a Commodore 64. They will not load from other disk drives. This can be attributed to the copy-protection scheme that many software companies add to their disks. The main purpose of copy protection is to prevent users from making copies of commercial software. Copyright laws make it illegal to copy and distribute books, songs, computer programs, and other creative works without permission from the author.

To prevent illegal copying, software companies often modify programs to make them difficult to copy. There are a variety of ways to protect software—adding disk sectors, introducing errors (which the software checks for) on the disk, using undocumented machine language op-codes, reprogramming the disk drive, and so on.

Very often, a program that employs copy protection will not load and run on any disk drive other than the 1541 or a perfect duplicate of the 1541. A disk-drive manufacturer could make an exact copy of the 1541 (including the ROM code inside), but that, in itself, would be illegal because the DOS that runs the 1541 is a program covered by copyright. So disk-drive manufacturers create work-alikes, *drives that do the same thing as a 1541 without using the same program to control the drive. If a copy-protected program depends on a certain routine located at a certain memory address inside the 1541, it probably won't work on a non-1541 drive. And there's not much you can do to change the program.*

Vicious Protection

I recently had a puzzling problem with my Commodore 128. I was using a database program in 64 mode. The program disk and data disk had each been used a number of times.

I'm not sure which key I pressed, but suddenly the screen went white and displayed large letters reading CRASH. There's no reference to CRASH in my user's manual. What does it mean?

Subsequent efforts to load data from the data disk resulted in a response of no data found. Loading the directory displays a disk named "PIRATE" 01 2A with 664 blocks free. What the heck is the significance of this message?

I am using a Commodore 1571 disk drive, and all other programs seem to behave normally. A considerable amount of data was on this disk, and I

WAR GAMES

FIREBIRD

IWO JIMA

"In the closing stages of the war in the Pacific, the U.S. Marines fought their costliest and toughest battle of the entire war – the capturing of the island of Iwo Jima.

Some 7000 marines died and more than 17000 were wounded in the 36 days of the battle, whilst only 216 Japanese troops survived of the original 22000.

In this computer simulation, the player commands the American forces, and the computer controls those of the Japanese. The simulation takes place over 32 – 36 days depending on which of the five levels of difficulty is selected.

BATTLE FOR MIDWAY **DATE: 4th June 1942,**

'Battle For Midway' puts you in command of the US Pacific fleets six months after the attack by the Japanese on Pearl Harbour.

'Battle For Midway' is not a simple game. It has been designed for the person who enjoys a stimulating intellectual game and incorporates every realism to ensure that what- ever the outcome of the game – that is the way it could have happened.

FALKLANDS 82

Falklands 82 is a simulation of the conflict between the Land Forces of the United Kingdom and Argentina over the period 21st May to 15th June 1982, following the invasion of the Falkland Islands by the forces of the Argentinian Junta. The screen map represents the Northern part of the East Falkland Island where the major part of the land combat took place.

The player commands the United Kingdom forces whilst the computer commands those of the Argentine, and the simulation takes place over 25-30 days depending on which level of difficulty is selected

BATTLE OF BRITAIN

The Battle of Britain took place between July and October of 1940, and was the German Luftwaffes attempt to defeat the R.A.F. and gain air superiority prior to Operation Sealion – the invasion of Great Britain scheduled for the summer of that year. The ensuing battle has gone down in history as one of the most courageous of WWII culminating in the defeat of the Luftwaffe and the cancellation of Operation Sealion.

In the famous words of Winston Churchill:
"Never has so much been owed by so many to so few"

FACT SHEET/ORDER HOTLINE: 201-444-5700 FIREBIRD LICENSEES INC. 71 N. FRANKLIN TURNPIKE, WALDWICK, N.J. 07463

would hate to retype it all. Can you suggest any means of rescuing the data?

William T. Quick

It sounds as if you're the victim of a vicious sort of copy-protection. The program probably did a check to see if you were using the original disk or a copy, by looking for a disk error in a certain place or reading a specific track or sector for a hidden message. For some reason, the program didn't find what it was looking for (whether or not you actually had the original) and erased your data disk.

The significance of pirate *is that's what people who make and distribute illegal copies of programs are sometimes called. You probably won't be able to recover the data and you'll have to type it in again, using another database (you probably wouldn't want to try again with that particular program).*

End-Of-Program Pointer

In the September "Gazette Feedback," you explained that loading a longer program from a shorter one could cause problems. Well, I've come across that problem and was interested when you said that it could be solved by POKEing to memory locations 45 and 46 at the beginning of the first (shorter) program. However, you forgot to tell what numbers to POKE there. Could you please give me the numbers to put there?

Glen Pittman

There's no single answer to your question; it depends on the lengths of the two programs. Load the short program and type this:

```
PRINT PEEK(45), PEEK(46), PEEK(45)
  +PEEK(46)*256
```

You'll see three numbers, the values in 45 and 46, plus the memory location that these numbers point to, which happens to be the end of the BASIC program and the beginning of variables. Now load the second (larger) program and type the same line. The third number should be larger than before.

At the beginning of the first (short) program, add a line that reads ***POKE 45,x: POKE46,y: CLR*** *where* x *and* y *are the numbers from the larger program. There's a small chance that the two programs are very close to the same size and that adding the two POKEs will make the first program larger than the second. Just to be safe, type the PRINT PEEK line one more time. If the third number is still smaller than the third number from the larger program, then you're in good shape. If the first program is now longer, replace the line containing the POKEs with a REM and 30–40 characters (it doesn't matter what they are; maybe you could add the name of the program and your name).*

Adding New Program Lines

I have a program that needs a line changed each time it is run. I tried using INPUT, but I can't change the string into a program line. Then I tried the following line:

```
10 PRINT "190 DEF FX(I) = ABS(EXP
   (I^2)"
```

I need a way to move the cursor to that line and execute a RETURN, to put line 190 into memory. Needless to say, I was unsuccessful. Can this be done?

Michael A. Lunsford

The dynamic keyboard technique *is what you need. On the 64, memory location 198 keeps track of how many keys have been pressed (up to ten characters), and locations 631–640 hold the ASCII values. To put the line into memory, add the following instructions to your program.*

First, clear the screen and have your program print ***190 DEF FX(I) = ABS (EXP(I^2))*** *on the top line, in preparation for pressing RETURN over it. Next,* ***POKE 631,19: POKE 632,13: POKE 198,2.*** *This instructs the computer that {HOME} and RETURN—CHR$(19) and CHR$(13)—have been pressed. The POKE to 198 indicates that two keys have been pressed. Finally, END the program. Your 64 will think that {HOME} and RETURN have been pressed and will add the line to the program.*

If you'd like to run the program again after the line has been added to memory, just add another 13 to the keyboard buffer (POKE 633,13) and put a 3 into 198 instead of a 2. Plus, you'll have to print RUN a couple of lines below the new line 190.

The computer will add the line to memory, and then you'll have to press RETURN over the RUN command, which will restart the program. Some programmers prefer to print the characters in the same color as the screen by executing ***POKE 646, PEEK(53281)*** *before the dynamic keyboard technique is used, just to make the screen look a little neater.*

A Fifth File Type

I was reading my disk-drive manual and discovered that by changing the directory load command, I could list just certain file types. For example, to load only SEQ or PRG file types, you could type

```
LOAD "$0:*=S",8
LOAD "$0:*=P",8
```

Of the choices given, one was *D* for deleted files. The above examples worked, but when I tried using a *D*, it loaded the regular directory. Why doesn't this work?

Dallas Plattsmeier

Most Commodore owners have seen PRG and SEQ files, which usually contain programs and sequential data files, respectively. Another fairly common file type is REL, which contains information in a relative (random access) file. Once in a while, you'll also see a USR file. USR files usually hold programs or data, and once in a while they'll hold a program that runs inside the disk drive's memory.

The fifth file type, which you'll almost never see is DEL (for DELeted files). Note that this is not the same as a scratched file. To create a DEL file, run the following program:

```
10 OPEN 2,8,2,"HELLO,S,W"
20 OPEN 3,8,3,"HELLO,S,W"
30 PRINT#2: PRINT#3
40 CLOSE2: CLOSE3
```

Save it to disk if you wish. If you now load the directory, with ***LOAD"$0",8*** *you'll see two files with the same name (HELLO). One is DEL, one is SEQ. There's no reason to use DEL files, however. They're available, but don't really serve any purpose.*

Also, we tried ***LOAD"$0:*=D",8*** *and it didn't seem to pick up deleted files, although* S *and* P *did work with SEQ and PRG files.*

Memory Locations And Ports

I was wondering if you could give me the memory locations for the user port, the cartridge expansion port, the cassette port, the serial port, the composite video connector, and the RGBI connector for the 128, so that I may use them in a program.

Jason Grizzle

There are basically three types of memory inside your 128: random access memory (RAM), read only memory (ROM), and registers that control the actions of support chips. RAM can be changed; you can PEEK it to see what's there or POKE it to change the number in memory. You can only PEEK ROM. If you try to POKE to a ROM location, its value will remain the same and, on the 64 and 128, another memory location will be changed in the RAM "underneath" the ROM.

Chip registers act as if they're RAM. You can usually PEEK and POKE them (except the SID chip), but they're not memory in the sense that RAM and ROM are memory. For example, the POKE that turns on the hi-res screen doesn't really change a memory location; it writes a value to a register inside the VIC chip, which changes its internal state to switch screen output to hi-res. The SID chip is unusual because you can POKE to various registers, but if you PEEK, the values will often differ from the number you POKEd.

Most of the ports you've asked about, the various connectors on the back of the computer, aren't directly addressable as memory locations. The input and output ports are controlled by various I/O chips within the computer.

Stuff their stockings with the perfect gift & save 33%

This year, give gift subscriptions to *Compute!'s Gazette.* You'll not only make their holidays happy, you'll spread cheer all year. Because they'll remember your thoughtfulness every time they receive another fresh and exciting issue.

Think of the people on your gift list (and don't forget yourself!) who would enjoy receiving this definitive guide to their Commodore. *Compute!'s Gazette* will bring them up to 20 all-new, action-packed programs each month — plus reviews, updates, analysis and more.

It's so easy to give a gift of *Compute!'s Gazette.* A 1-year gift subscription (12 issues) is only $24. You save a full 33% off the $36 cover price and you won't be billed until after January 1st. At this Happy Holiday rate, you can afford to make a lot of people happy — and wrap up your holiday shopping fast! An attractive gift card comes with each gift subscription. Happy Holidays to you.

Special Holiday Package

Make that extra-special person extra happy. Give a 1-year gift subscription to *Compute!'s Gazette* PLUS a 1-year subscription to *Compute!'s Gazette Disk* for only $75.

To Order Call Toll-Free 1-800-247-GIFT
In Iowa 1-800-532-1272

COMPUTE!'s
GAZETTE

SCIENTISTS A
DISCOVER NE

When we started our company on the west coast, people thought we were a little spaced out. So you can imagine their reactions when we announced we'd discovered a new universe.

People laughed. People scoffed. And they really freaked out when we told them where we'd found it:

Inside a Commodore 64.

It's called GEOS. And it turns any Commodore into a powerful PC that holds its own against any computer, no matter what kind of fruit it was named after.

GEOS: The superior intelligence. Of course, we always knew Commodores possessed superior brains. It just took GEOS to discover them.

You see, GEOS opens your Commodore to a huge universe that can hold an infinite number of applications. Which means that GEOS can do just about anything the expensive PC's can do, including one thing they can't:

Add even more GEOS applications that are being developed even as you read this.

Increase your speed to warp factor 7. The first thing you notice with GEOS is how its diskTurbo speeds up your Commodore's disk loading and storing time.

GEOS
GRAPHIC ENVIRONMENT OPERATING SYSTEM
THE NEW OPERATING SYSTEM STANDARD FOR
THE COMMODORE 64, 64c AND 128 COMPUTERS

Not twice or three times as fast. But five to seven times faster than normal. Which lets you streak through files and documents at what seems like warp speed.

And that saves you endless time.

Every universe comes complete with a desk. The way to keep order in our universe is with the GEOS Desktop. It's just like your desk at home, only without the coffee stains.

The Desktop keeps your art and documents filed, and comes

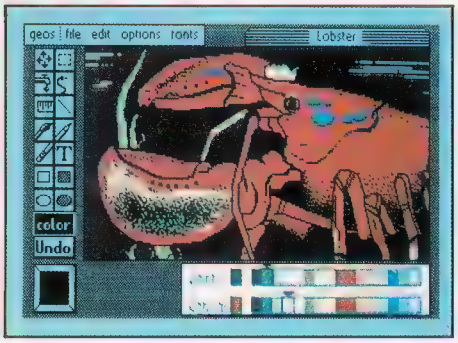
T BERKELEY
W UNIVERSE.

with all the accessories you need to keep you organized:

An alarm clock keeps you punctual. A notepad keeps your memos. And a calculator keeps your accountant honest.

How to communicate with a new universe. With geoWrite, you can rearrange your written words. Move blocks of copy. Cut and paste. And even display your text in fonts of different styles and sizes, right on the screen.

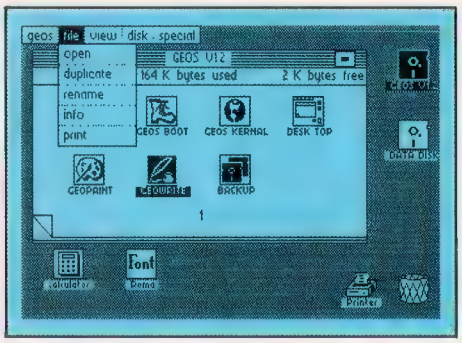
With geoPaint, you become a Michelangelo with a mouse.



Sketching and painting with all kinds of colors, textures and patterns.

You can invert, mirror and rotate images. Insert them into your geoWrite documents. And save them in your GEOS Photo Album for use later.

Finding your way through the universe. The most difficult



thing about a new universe is finding your way around. But with GEOS, you only need to remember two things:

Point and click.

When GEOS offers you options, you just point to your answers and click your mouse or joystick.

You want to draw? Point and click.

You want to write? Point and click.

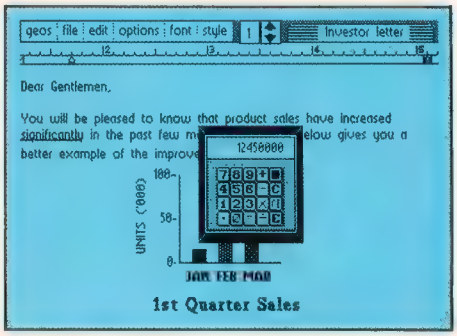
You want to fill in that obtuse rhomboid with an air-brushed geometric pattern in a lighter shade of pink? Point and click.

Easy, huh? And in case you ever do make a mistake, GEOS backs you up with an "Undo" feature that undoes the very last command you entered.

Running out of space. With GEOS, that's hardly likely. Because there's endless space in the universe for new applications.

Unfortunately, there's only so much space in this ad.

So zip down to your nearest software dealer. Tell him you want to explore the new universe in your Commodore.


geos file edit options font style
Investor letter
Dear Gentlemen,
You will be pleased to know that product sales have increased
significantly in the past few
better example of the improv
12458888
UNITS (000)
JAN FEB MAR
1st Quarter Sales

And if he looks at you like you're some kind of alien, well, just tell him Berkeley Softworks sent you.

The name is universally known.

To order, call 1-800-443-0100 ext. 234

GEOS is just $59.95

(California residents add 6.5% sales tax.) $2.50 US/$5.50 Foreign for shipping and handling. Allow six weeks for delivery.

Commodore 64 and C64 are trademarks of Commodore Electronics, Ltd. GEOS, GEOS Desktop, geoPaint, geoWrite, diskTurbo and Berkeley Softworks are tradenames of Berkeley Softworks.

Berkeley Softworks

The brightest minds are working at Berkeley.

THE UNIVERSE

Well, we told you it wouldn't be long until the first GEOS applications were ready. And these are just the first. The number of satellites in the GEOS universe is infinite.

Judge Font Pack on looks alone. Let's face it. People judge your work not only by what it says, but how it looks.

That's why we developed Font Pack. A collection of 20 different type styles that not only say what you mean, but really look like they mean it.

Durant is charming. **Boalt** is all business. FontKnox is financial. And **Telegraph** is ... hmmm, well, you get the point.

When you combine these 20 fonts with the five you get with geoWrite, your work not only reads

better, it practically speaks for itself.

Look what we found in your desk. You know how there's always one drawer in your desk that's filled with really neat stuff? Well, GEOS has one of those, too.

It's called Desk Pack.

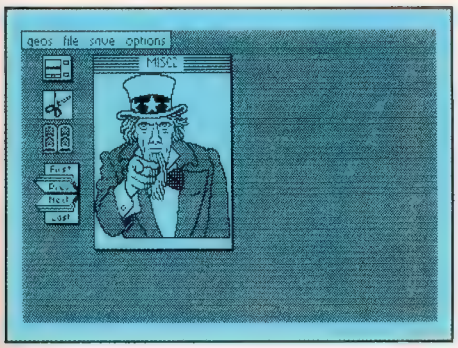
The ingenious Desk Pack Graphics Grabber copies graphics from clip art galleries like Print Shop, Print Master and Newsroom for use in geoWrite and geoPaint.

The Desk Pack Calendar pops up whenever you need to plan your schedule. And since it's valid until the year 9999, you'll never have to miss one of those swell family

IS EXPANDING.

DESKPACK 1™
4 NEW APPLICATIONS FOR USE WITH GEOS™
GEOS
FOR THE COMMODORE 64, 64c AND 128 COMPUTERS
Art Grabber: allows access to "clip art"
Icon Editor: create your own icons
Calendar: for all your dates
Black Jack: gaming for fun
Softworks

New discoveries reported. The GEOS universe is expanding. And we'll report each new discovery to you as it occurs.



In the meantime, add Desk Pack and Font Pack to your GEOS system. And see how much you can explore.

reunions ever again.

There's even an Icon Editor, which lets you customize your GEOS file icons with the graphic of your choice.

And when you can't deal with work, Desk Pack deals the sharpest Black Jack game this side of Vegas, complete with graphics and sound effects.

To order, call 1-800-443-0100 ext. 234
Font Pack $29.95 Desk Pack $34.95
(California residents add 6.5% sales tax.) $2.50 US/$5.50 Foreign for shipping and handling. Allow six weeks for delivery.

Commodore 64 and C64 are trademarks of Commodore Electronics, Ltd. GEOS, GEOS Desktop, geoPaint, geoWrite, diskTurbo and Berkeley Softworks are tradenames of Berkeley Softworks.

Berkeley Softworks

The brightest minds are working at Berkeley.

The composite video port puts out three signals: chroma, luma, and audio. To change the audio output, you must POKE to the SID chip which is in charge of music and sound. To change chroma, you POKE to color memory and to the various color registers within the VIC chip that define multicolors and sprite colors. To change luma, POKE to screen memory and/or character memory (if you're using custom characters) or to hi-res memory (in hi-res mode) or sprite shapes, wherever they may be at the time.

The RGBI port's output is in the jurisdiction of the VDC chip, to which you can POKE to affect what's happening on the 80-column screen.

The user port can be addressed as device 2. It's most often used for connecting a modem, although you can attach printers and other devices there. You would OPEN 2,2 (plus various secondary addresses and additional information), then PRINT#2 to send a signal and INPUT#2 or GET#2 to retrieve data.

The cassette port is device 1. The serial port can control devices 4–255 (usually printers or disk drives). You can OPEN a channel to either of these and then INPUT# and GET# to read; PRINT# to write.

The cartridge port can be treated as memory starting at either $8000 or $C000 (in both 64 and 128 modes). To create your own cartridge, you need something called an EPROM burner, which creates an electrically programmable ROM chip.

If you're interested in experimenting with electronics projects involving the 64, we can recommend Electronic Computer Projects for Commodore and Atari Computers *from COMPUTE! Books.*

The RAM Under BASIC

I have two questions. First, the *Programmer's Reference Guide* for the 64 says that locations 40960–49151 are BASIC ROM or 8K RAM. How is this possible? Also, is there any way to link the protected RAM locations 49152–53247 to the BASIC programming area?

Jason DeStefano

The memory locations you mention hold either the BASIC ROMs or RAM (for your own program)—but not both at once. The RAM is said to be "under" the ROM because when you turn on the computer the ROM is switched in automatically. You can POKE to the RAM here, but you can't read it without turning off BASIC, which can be accomplished by typing POKE 1, PEEK(1) AND 254. However, this will crash your computer because the POKE turns off BASIC completely. Without BASIC, your computer can't communicate with you. This technique is useful mostly for machine language programmers who need the extra RAM, but don't need the BASIC interpreter. Some programs copy BASIC from ROM to RAM to make changes in the BASIC interpreter itself. These changes last until power is turned off or until RUN/STOP–RESTORE is pressed. The operating system (locations 57344–65535) also has RAM underneath it.

There's no easy way to link the RAM at 49152 to the BASIC RAM because there's something in the way—BASIC itself. BASIC assumes that it is using contiguous memory—memory that's not broken up into segments. It's possible to store things in this area using the POKE statement, but beware—many machine language programs (like the DOS Wedge) put themselves into this "safe" area.

Translating Pseudo-ops

Recently I typed in "The Fast Assembler" from the January 1986 GAZETTE. While most of the ML commands seem to work, I have stumbled across one that continually produces a syntax error which I don't know how to fix:

```
54 LDA #<CHRBAS
55 STA MVSRCE
56 LDA #>CHRBAS
57 STA MVSRCE+1
```

where CHRBAS=$D000, MVSRCE =$FB.

In this example, lines 54 and 56 both produced syntax errors.

Pat McConville

We can divide machine language operations into two categories. The first category contains operation codes (op-codes for short); the second group contains pseudo-operands (pseudo-ops). The op-codes are usually specified by the maker of the microprocessor, and most assemblers follow these guidelines closely. Examples of standard op-codes are LDA and STA.

Extensions to the assembler are known as pseudo-ops, which aren't really ML instructions. Rather, pseudo-ops give directions to the assembler. The < and > symbols in your example are used to tell the program to use the low and the high byte of a value. Since these are very important functions, all full-featured assemblers allow some way to express this. "The Fast Assembler" does this differently. Try this:

```
54 LDA #CHRBAS - (INT(CHRBAS/
   256) * 256)
55 STA MVSRCE
56 LDA #INT(CHRBAS/256)
57 STA MVSRCE+1
```

Since these operators are so common, you might want to define functions L and H and use them instead.

```
10 DEF FN H(X)=INT(X/256)
20 DEF FN L(X) = X - (256 * FNH(X))
54 LDA #FN L(CHRBAS)
55 STA MVSRCE
56 LDA #FN H(CHRBAS)
57 STA MVSRCE+1
```

*Other pseudo-ops may differ between assemblers. Some assemblers use *= to give the starting address, others use .ORG. Some use DB to define bytes, others use .BYTE.*

Noisy Random Numbers

I have read that you can use voice 3 on the Commodore 64 as a random-number generator. How do you do this?

Jason Hall

The idea behind this is that since we can set voice 3 to make noise, and since noise as produced by the computer is simply a succession of random frequencies, then the computer must be producing random numbers somewhere. Fortunately, we can read the register which holds these random numbers. Here's an example of how it's done:

```
10 POKE 54287,255:POKE 54290,128:
   POKE 54296,128
20 PRINT PEEK(54299)
30 GOTO 20
```

This program prints random numbers until you press STOP. You may notice that all the random numbers lie between 0 and 255. That's because we're looking at random bytes, and bytes can only hold numbers between 0 and 255. To get a random integer between 0 and 9, try this line instead:

```
20 PRINT INT(PEEK(54299)*10/256)
```

Reading the noise register is sometimes used in machine language programming, but is rarely seen in BASIC programs because BASIC already has a function for generating random numbers.

All programs listed in this magazine are available on the GAZETTE Disk. See details elsewhere in this issue.

21st CENTURY WARRIOR:

Apache GUNSHIP™

THE ATTACK HELICOPTER SIMULATION

tronic battlefield.

Gunship's revolutionary 3-D graphics enable you, the pilot, to fly into the world's hottest trouble spots... You'll use an unbelievable array of high tech information and weapon systems, including and a 30mm cannon! Successful missions will be rewarded with medals and rank promotions.

Experience the danger and excitement of attack helicopter action... your latest adventure in the ever-growing line of MicroProse Simulation Software.

Challenge the enemy, the sky, and yourself with this extraordinary simulation!

GUNSHIP for Commodore 64/128 and Atari XL/XE computers at a suggested retail of $34.95, also for Apple II Family, IBM PC/PC Jr., Tandy 1000, Atari ST and Amiga at $39.95. Call or write for specific machine availability, and for MC/VISA orders if product not found locally.

MICRO PROSE™

SIMULATION • SOFTWARE

120 Lakefront Drive • Hunt Valley, MD 21030 • (301) 771-1151

Sophisticated Simulations

Selby Bateman, Features Editor

Pilot a plane over the Golden Gate Bridge, command the Army of the Potomac, manage a major league baseball team to a World Series win. Simulations of the real world are among the most popular forms of computer entertainment and education today, both at home and in a variety of professions. There are dozens of such simulations available for your Commodore 64 or 128, and more arriving almost every day.

A young Air Force pilot repeatedly crashes his jet and walks away unscratched. A businessman sees his stocks plummet and doesn't lose a dime. An engineer spots a costly error in an experimental automobile and fixes it in seconds.

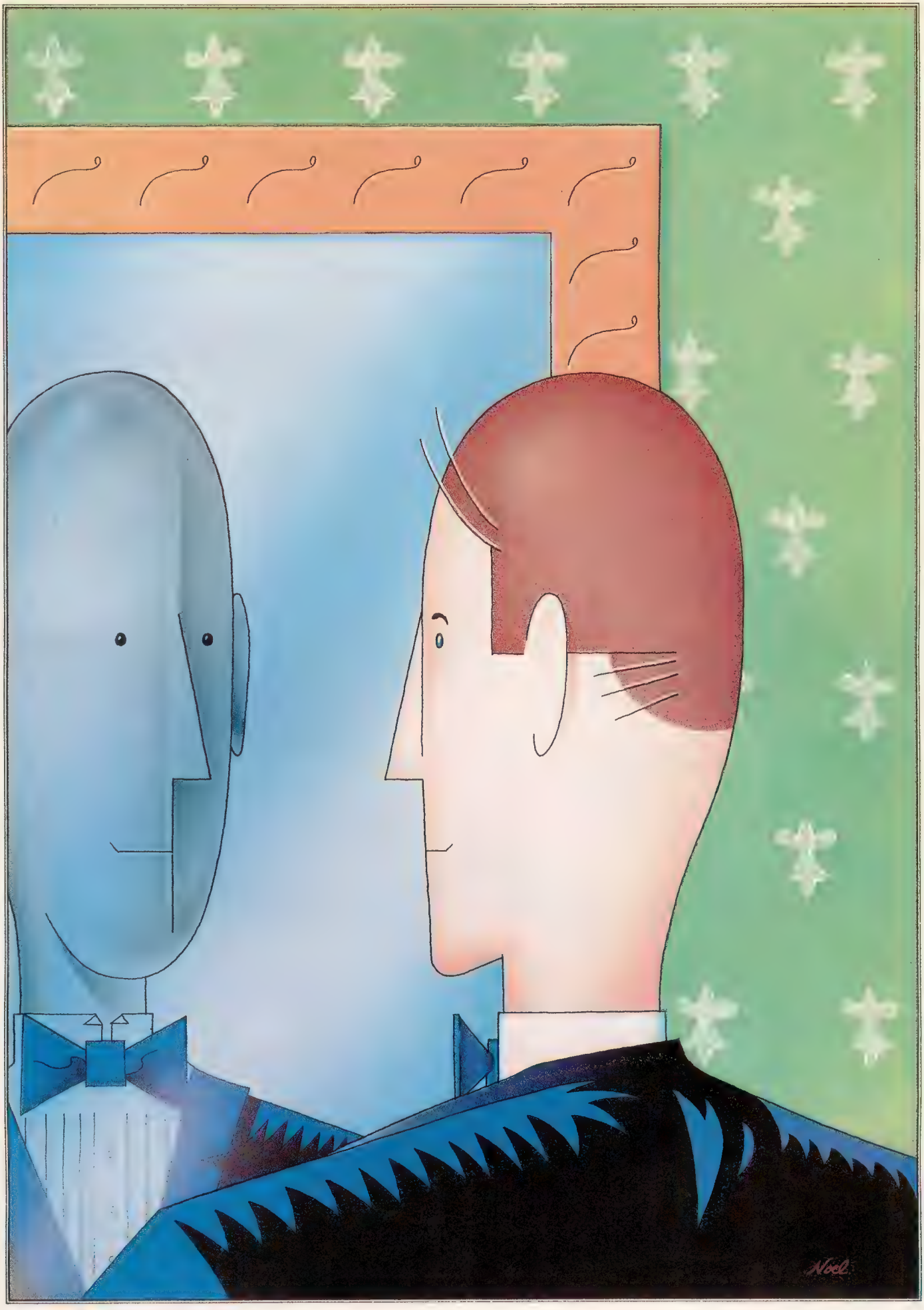
All of these potentially dangerous and costly situations are simply computer simulations, digital models of real life. Simulating the real world is a task that computers have been doing since the days of the early mainframe computers. There's nothing more going on at the core of these simulations than *number crunching*—the processing of millions of different instructions in seconds.

As computers have grown more powerful—with larger memories and improved graphics and sound—the range of things that can be simulated has expanded radically. The first simulations were really just statistical what-if situations in which a given set of numbers produced its results when applied in different ways. In this respect, even a computerized spreadsheet can be considered a good what-if simulator. That's how it's most often used in financial modeling, and the spreadsheet today is regularly used to assist in making business decisions. Yet computers now allow far more to be simulated: not just numbers, but the visual and aural representation of those numbers as well. Computer-aided design (CAD), for example, can include a computer-generated construction so lifelike it almost seems real. Large mainframe computers and minicomputers that control the most advanced flight simulators produce realistic views from the mock cockpit, including three-dimensional landscapes, shaded objects that can also move, sound effects, and much more.

At the heart of these simulations, however, is the same basic numerical manipulation that accompanied the first computer modeling. What's changed, of course, is the computer's ability to handle many millions of additional numbers in a far shorter time.

Computer modeling and simulations are used extensively today by the armed forces in order to teach personnel to operate sophisticated equipment without the expense and danger of using the real thing. Engineers, architects, chemists, and many other professionals can experiment with simulations that would have seemed like magic just ten years ago.

While the Commodore 64 or 128 obviously doesn't have the power of the giant mainframes and minicomputers, it does offer a rich environment for certain kinds of


Noel

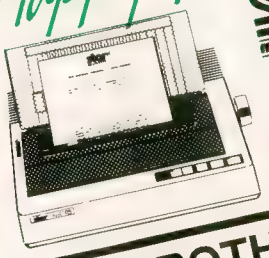
tcp HOLIDAY SAVINGS

ORDERS ONLY
CALL TOLL FREE **1-800-468-9044**

Happy Holidays

star micronics inc

NX-10
PRICE DROP TO
$214.95



BROTHER 1509

180 CPS DOT MATRIX PRINTER, 15" CARRIAGE, FRICTION AND TRACTOR FEED, 45 CPS NLO MODE, & 3K BUFFER. USES EPSON FX PRINT CODES.

$379 OUR PRICE

PRINTER PACKAGES

ALL PRINTERS INTERFACE WITH C-64 or C128

star micronics inc
NX-10 & XETEC SUPERGRAPHIX.... $279.95
NX-10 & XETEC Supergraphix Jr. $259.95

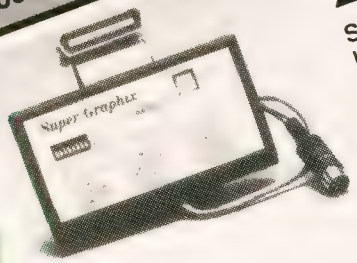
PANASONIC
1091 & XETEC SUPERGRAPHIX..... $279.95
1080 & XETEC Supergraphix Jr. $229.95
1092 & XETEC SUPERGRAPHIX..... $359.95

SEIKOSHA
SP-1000A & XETEC Supergraphix Jr. $229.95

EPSON
LX-86 & INTERFACE.. LOWEST PRICE
DX-10 DAISYWHEEL & $CALL FOR
XETEC Supergraphix Jr..... $219.95

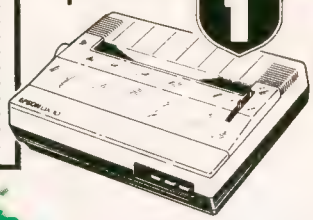
BROTHER
1509 & XETEC SUPERGRAPHIX..... $419.00

XETEC
SUPER GRAPHIX
Interface w/8k buffer
down loadable fonts
$$$LOWEST PRICE
SUPER GRAPHIX JR ... $46.95
printer interface ... $34.95
Font Master II ... $34.95



EPSON® CLOSEOUT SPECIAL!!!

EPSON DX-10
DAISYWHEEL PRINTER
NEW LOW PRICE
$179



CLOSEOUT SPECIAL!!
Wordpro 3+/64
$14.95
while supply lasts

PRO-LINE SOFTWARE

GT4	$22.95
BUDDY 128 assembler	$CALL
C POWER	$CALL
C POWER 128	$CALL
C COMPILER	$CALL
CADPIC	$36.95
CASHBOX	$36.95
MAILPRO 64	$24.95
PROFILE 64	$36.95
PAL 64	$32.95
POWER 64	$32.95
SPELLPRO 64	$32.95
TOOLBOX 64	$59.95
WORDPRO 64	$36.95
WORDPRO GTS	$CALL

Software orders over $50.00 will be shipped FEDERAL EXPRESS (yes, even with *these* prices)
You only pay TCP's standard shipping charge of $4.00 per order This offer also valid on peripherals and accessories under 8 pounds Orders arriving before 11:00 AM our time will be shipped out same day.*

FEDERAL EXPRESS*

Computerized order entry, processing and status allow TCP to serve you faster and better!

SEE NEXT PAGE FOR FULL TERMS

tcp TUSSEY COMPUTER PRODUCTS P.O. BOX 1006 STATE COLLEGE, PA 16804

WITH SUPER VALUES!!

INFORMATION AND PA ORDERS 814-234-2236

OPEN 9am-8pm: Mon-Fri, 10am-5pm Sat EAST COAST TIME
HOLIDAY HOURS Dec 1-23: M-T 9am-10pm, F 9am-8pm, S&S 10am-6pm

ALL COMMODORE PRODUCTS ON SALE NOW!!

1670 MODEM	$124.95
1350	$39.95
C128	$NEVER LOWER
1571	$ROCK BOTTOM PRICING
1902A	$LOWEST PRICE EVER
1750 RAM EXPANSION	$CALL

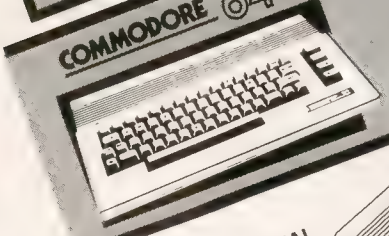
VISASTAR 128 & VIZAWRITE 128
HOLIDAY SPECIAL PACKAGE PRICE **$129.95**

SEIKOSHA SP-1000 VC
COMMODORE READY 2YR WARRANTY
NEW LOW PRICE **$164.95**

ONLY $174.95
Includes GEOS & Quantrum Link
1541C DISK DRIVE..... $CALL
1802C MONITOR..... $CALL

GEOS C64 COLOR VERSION $CALL

COMMODORE 64C



COMMODORE 128
1571 DISK DRIVE
MAGNOVOX 8562
RGB/Composite monitor

HOLIDAY SPECIAL PACKAGE PRICE
$739

COMMODORE 128 SOFTWARE
For 128 in 128 or CPM modes

WORD PROCESSORS	
JANE	$32.95
VIZAWRITE 128	$CALL
WORDPRO 128	$59.95
WORDPRO 128S w/spell	$CALL
PAPERCLIP	$37.95
PAPERCLIP w/spell	$49.95
W'DWRITER 128 w/spell	$CALL
PERFECT WRITER	$49.95
PAPERBACK WRTER 128	$CALL
PAPERBACK WRTER II w/spell	$47.95
FLEET SYSTEM II w/spell	$CALL
FLEET SYSTEM III	$CALL
w/spell & thesaurus	$59.95
SUPERSCRIPT 128	$44.95
SPREADSHEETS	$CALL
EPYX MULTIPLAN	$49.95
PERFECT CALC	$CALL
SWIFTCALC 128 w/sdways.	$49.95
PAPERBACK PLANNER 128	$CALL
DATA BASES	$39.95
CONSULTANT	$59.95
PROFILE 128	$CALL
PERFECT FILER	$CALL
DATE MANAGER 128	$CALL
PAPERBACK FILER 128	$CALL
SUPERBASE 128	$CALL
MISC. 128 SOFTWARE	$39.95
VIZASTAR 128	$47.95
MACH 128	$34.95
MATRIX from Prog Periph	$59.95
DESK MANAGER 128	$34.95
C POWER from Proline	
PERSONAL ACCT 128	$54.95
SYLVIA PORTER'S personal finance planner	$42.95
BUDDY 128 assembler	$54.95
PARTNER 128	$24.95
I am the C128	

Many Thanks to our fine Customers for making 1986 a terrific year!!

ELECTRONIC ARTS™

CLASSICS ON SALE !!! Buy 2-4 $13.95 each Buy 5 or more $12.95
$14.95 EACH

Archon	Racing Destr. Set
M.U.L.E.	Heart of Africa
Pinball Constr. Set	Super Bolder Dash
Seven Cities of Gold	Mail Order Monsters
Cut & Paste	One on One
Music Construction Set	Realm of Impossible

MORE ELECTRONIC ARTS SOFTWARE ON NEXT PAGE

ORDERS ONLY...CALL TOLL FREE **1-800-468-9044**

tcp

tcp HOLIDAY SAVINGS

ORDERS ONLY
CALL TOLL FREE **1-800-468-9044**

Happy Holidays

TCP leads the way!!!
HARD DRIVES FOR THE 128 AND 64
FROM JCT. Plugs into the disk drive part just like the 1571 to maximize compatibility • 5 year warranty on the mechanical portion of the Hard Drive. 1 year warranty on electronics. Immediate replacement within 1 year.

3 DIFFERENT MODELS AVAILABLE:
- **JCT 1000, 3.7MB of memory.....$CALL**
- **JCT 1005, 5MB of memory.....$CALL**
- **JCT 1010, 10MB of memory.....$CALL**

(less than $829.00!!! call for best price)

NOW AVAILABLE THROUGH TCP!!!

AMIGA

Call for our package price on AMIGA hardware

ENHANCER 2000
$159 DISK DRIVE
1 YEAR WARRANTY

80 Column Board for the C-64
Only $39.95
The Data 20 XL-80 is an 80 column card that plugs into the back of your C-64. Recommend use with monochrome monitor.

The Print Shop
Broderbund Print Shop $25.95
Print Shop Companion $22.95
Graphics Library I, II or III $16.95
120 sheet color paper refill $8.95
½ red, ½ blue, ½ gold

SAT Preparation With HAYDEN
Prepared by Professionals
SAT Score Improvement System $59.95
Includes Preparation for Math, Reading comp., Vocabulary, Quantitative Comparisons, and Word problems
SAT Practice Test $17.95

INFO DESIGNS SALE!!!
General Ledger, Accounts Payable, Accounts Receivable, Payroll, Inventory, Communication Edge, Management Edge, Negotiation Edge, or Wordpro 3+/64
$19.95/EA

SEIKOSHA
2 YR WARRANTY
SP-1000VC $179.00
SP-1000A or SP-1000I .. $199.00

MONITORS

COMPOSITE COLOR
TAXAN 220 ..... $169.00
14" separated video, mono mode
THOMPSON 36632 ..... $149.95
MULTITECH 131 ..... $149.95
Din to RCA phono jack cable .. $6.95

MONOCHROME
ZENITH 1220 12" flat amber $94.00
ZENITH 1230 green $94.00
GOLDSTAR 12" med resolution amber or green $79.95
PANASONIC 120 12" amber $79.95

RGB Composite for the 128
MAGNAVOX 8562 2 yr warranty monochrome mode $259.95
THOMPSON 36512VC mono mode separated video $257.95

MODEMS

VOLKS 6480 300/1200 baud	$124.95
WESTRIDGE	$49.95
MESSENGER	$42.95
1660	$CALL
MITEY MO	459.95
VIP TERMINAL	$34.95
VIDEX TERMINAL	$23.95
COMPUSERVE STR KIT	$19.95
PLAYNET STARTER KIT	$14.95

CMS General Acct System
includes: • General Ledger • Accts Receivable • Billing • Statements • Accts Payable • Check Writing • Job Costing • Payroll
Pkg. Price for all Modules:
C128 version $124.95
C64 version $119.95

DISKS
per box of 10

BONUS DISKS SS/DD	$7.45
DS/DD	$7.95
NASHUA DISKS SS/DD	$8.95
DS/DD	$9.45
TUSSEY DISKS SS/DD	$8.45
DS/DD	$8.95

UUU Unison World
Printmaster $29.95
Art Gallery ..... $CALL
SOLUTION UNLIMITED
Icon Factory $29.95
Billboard Maker $29.95

Closeouts!
COMREX
COMREX 220 ...$119.95
Commodore Ready ... 3 month Warranty from Epson

SAT Preparation With HAYDEN
Prepared by Professionals
Score Improvement System $59.95
Includes Preparation for Math, Reading comp., Vocabulary, Quantitative Comparisons, and Word problems
SAT Practice Test $17.95

PRINTERS

Epson Printers 1 yr warranty

LX-80	$229.00
HOMEWRITER 10	$CALL
FX-85	$359.00
FX-286	$CALL
RX-100	$279.00
DX-10	$CALL
HS-80 INKJET	$CALL

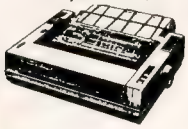
JUKI

PRINTER/TYPEWRITER
6100P ..... $CALL

Printer Interfaces

G-WIZ	$49.95
MW-350 w/10k buffer	$CALL
CARDCO SUPER G	$CALL
TYMAC Connection	$67.95

PANASONIC
2 YR WARRANTY
1091 ...$229.00
1080 ...$199.00
1092 ..... $CALL
1592 ..... $CALL
3131 Daisywheel ..... $CALL
3151 Daisywheel ..... $CALL



star micronics · inc

NX-10	$214.95
NX-10C	$CALL
NL-10C	$CALL
SG-15	$364.00
SD-10	$323.00
SD-15	$449.00
POWERTYPE 18cps, daisywheel	$229.00
SR-10,SR-15	$CALL

- If through some oversight we don't have the the lowest price, we would appreciate the opportunity to beat it. If we can, you will get the benefit of our Federal Express shipping on software orders over $100.00.
- We accept Mastercard, Visa, COD and mail orders.
- Purchase orders are accepted from qualified corporations and institutions. Minimum order of $500.00 required.
- No sales tax on orders outside of PA.
- Buy with confidence. We honor manufacturers warranty.

VISA MasterCard

To order by mail: We accept money order, certified check, personal check, Allow 2 weeks for personal check to clear
Shipping: $4.00 for software and accessories/$10.00 for printers and color monitors/$8.00 for disk drives and other monitors/Add $3.00 per box shipped COD. Call for other shipping charges. Additional shipping required on APO, FPO, AK, HI, and foreign orders.

Terms: ALL PRICES REFLECT CASH DISCOUNT, ADD 1.9% FOR MASTERCARD OR VISA. Manufacturer's warranty honored with copy of our invoice. **ALL SALES ARE FINAL.** Defective items replaced or repaired at our discretion Pennsylvania residents add 6% sales tax. Prices and terms subject to change without notice

tcp TUSSEY COMPUTER PRODUCTS P.O. BOX 1006 STATE COLLEGE, PA 16804

WITH SUPER VALUES!!

INFORMATION AND PA ORDERS 814-234-2236

OPEN 9am-8pm: Mon-Fri, 10am-5pm Sat EAST COAST TIME
HOLIDAY HOURS Dec 1-23: M-T 9am-10pm, F 9am-8pm, S&S 10am-6pm

GAME GALLERY Educational Software too!

All Games stocked for quick ship!!!

MISC GAMES

Hobbitt	$CALL
Sargon III	$37.95
Murder by the Dozen	$24.95

ACCESS

Beach Head	$24.95
Beach Head 2	$29.95
Leader Board	$29.95
Leader Board Tourn. Disk	$16.95

ACCOLADE

Dam Busters	$22.95
Fight Night	$22.95
Hard Ball	$22.95
Law of the West	$22.95
PSI 5 trading co	$19.95

ACTIVISION

Alcazar	$19.95
Borrowed Time	$19.95
Comp. Firewks Celebrat'n	$19.95
Countdown to shutdown	$19.95
Fast Tracks Slot Car Const	$24.95
Garry Kitchen's Gamemakr	$24.95
Ghostbusters	$19.95
Great Amer RR	$24.95
Hacker	$19.95
Little Computer People	$19.95
Master Of Lamps	$19.95
Mindshadow	$19.95
Pitfall II Lost Caverns	$19.95
Space Shuttle	$26.95

AVALON HILL

Superbowl Sunday	$16.95
Team Disk for SS	

BRODERBUND

Champshp Lode Runner	$24.95
Karateka	$19.95
Lode Runner	$24.95
Music Shop	$29.95

BLUE CHIP

Baron	$24.95
Millionaire	$24.95
Tycoon	$24.95

COMMODORE

Sky Travel	$27.95

ELECTRONIC ARTS

Adventure Constr	$27.95
Archon 2	$27.95
Bard's Tale	$32.95
Carriers at War	$37.95
Europe Ablaze	$37.95
Hard Hat Mack	$13.95
LordS of Conquest	$24.95
Movie Maker	$27.95
Reach for the Stars	$32.95
Sky Fox	$24.95
Software Golden Oldies	$16.95
Tim Leary's Mind mirror	$24.95
Touchdown Football	$22.95
Ultima IV	$45.95

DATA EAST

Karate Champ	$26.95
Kung Fu master	$26.95
Spy Hunter	$31.95
Star Trek-Kobayashi alt	$29.95
Typing Tutor III	$29.95

SPECTRUM HOLOBYTE

Gato	$CALL

SPINNAKER

Adventure Creator	$22.95
Alphabet Zoo	$16.95
Cosmic Combat	$CALL
Delta Drawing	$19.95
Facemaker	$19.95
Hey Diddle Diddle	$16.95
Homework Helper	$CALL
In search of the m-a- thing	$18.95
Kung Fu	$CALL
Snooper Troops I or II	$18.95

Call for prices on other EPYX products !

INFOCOM

Cut Throats	$22.95
Deadline	$25.95
Enchanter	$22.95
Hitchhiker's Guide	$29.95
Infidel	$25.95
Planetfall	$29.95
Sorcerer	$29.95
Spellbreaker	$25.95
Suspect	$25.95
Wishbringer	$22.95
Witness	$26.95
Zork I	$26.95
Zork II	
Zork III	

SPRINGBOARD

Early Games	$26.95
Easy As	$29.95
Piece of Cake Math	$26.95

INVISICLUE BOOKS FOR ANY INFOCOM GAME $6.95

MINDSCAPE

Bank Street Music Writer	$27.95
Bank Street Storybook	$27.95
Castle Clobber	$18.95
Halley Project	$27.95
Indiana Jones	$22.95
Quake minus one	$17.95
Shadowfire	$17.95
Perfect Score SAT prep	$49.95
The Lords of Midnight	$17.95

Call for prices on other MINDSCAPE products!

MICROLEAGUE

Microleague Baseball	$27.95
Microleague general mgr	$27.95
Microleague 1985 teams	$15.95

MICROPROSE

Acrojet	$24.95
Crusade in Europe	$27.95
Decision in the Desert	$27.95
F-15 Strike Eagle	$21.95
Gunship	$24.95
Conflict in Vietnam	$CALL
Helicat Ace	$21.95
Kennedy Approach	$24.95
NATO Commander	$24.95
Silent Service	$21.95
Solo Flight	$24.95
Spitfire Ace	
Top Secret	

RADARSOFT

Maps USA	$34.95
Maps Europe	$34.95
World Maps	$34.95

RANDOM HOUSE

Garfield	$17.95
Garfield Double Dares	$17.95
Snoopy's reading machine	$17.95
Snoopy's sky writer	$17.95
Snoopy's writer	$17.95

SIMON & SHUSTER

Paper Airplane const	$CALL
JK Lasser's Income Tax	$39.95
Kermit's Story Maker	$19.95
NY Times Crossword Puzzle Vol 1 or 2	$14.95

STRATEGIC SIMULATNS

Baltic	$26.95
Battalion Commander	$29.95
Battle Group	$47.95
Battle of Antietam	$39.95
Battle for Normandy	$29.95
Breakthrough Ard	$47.95
Broadsides	$29.95
Carrier Force	$29.95
Cartels	$29.95
Colonial Conquest	$47.95
Combat Leader	$29.95
Computer Ambush	$29.95
Computer Baseball	$47.95
Computer Quarterback	$16.95
Field of Fire	$26.95
Fighter Command	$47.95
Fortress	$29.95
Gemstone Warrior	
Germany 1985	
Imperium Galactum	
Kampgruffe	$47.95
Kampgruffe scenario	$17.95
Knights Desert	$29.95
Mech Brigade	$47.95
Nam	$26.95
Norway 85	$39.95
Operation Marketgarden	$29.95
Panzer Grenadier	$29.95
Phantasie	$29.95
Phantasie II	$29.95
President Elect	$26.95
Questron	$29.95
RDF 1985	$29.95
Rails West	$29.95
Tour Golf	$47.95
Tigers in the Snow	$29.95
USAAF	$29.95
Wings of War	$47.95
Wizards Crown	$29.95
50 Mission Crush	$29.95

C-64 BUSINESS AND PRODUCTIVITY

C-64 WORD PROCESSORS

Paperback Writer	$CALL
Paperback Writer Dictnry	$19.95
Bank Street Writer	$CALL
Bank Street Speller	$34.95
Cut & Paste(EOA)	$17.95
Font Master II	$34.95
Wordpro 64	$36.95
Spellpro 64	$32.95
Fleet System II	$14.95
Wordpro 3+/64	$CALL
Papercilp	$37.95
Papercilp w/spellpack	$49.95
Mirage Professional WP	$36.95
Trio	$CALL
Word Writer 64 w/speller	$34.95
Kid Pro Quo	$32.95

C-64 DATABASES

Bank Street Filer	$34.95
Consultant	$39.95
Mirage Dbase w/Rprt gen.	$36.95
Profile 64	$36.95
Data Manager	$19.95

C-64 SPREADSHEETS

Paperback Planner 64	$CALL
Vizastar 64	$79.95
Practicalc(d) or (t)	$CALL
Calkit	$39.95
Hes Multiplan	$29.95
PS, Programble Sprdsht	$19.95
Swiftcalc 64 w/sideways	$39.95
Sidways	$19.95
Calc Result Adv (d,c)	$67.00

CARDCO

Freeze Frame	$39.95
Numeric keypad	$34.95
5 slot cart. exp	$54.95
S'more Basic	$49.95

PROLINE

GT4	$22.95
Fast save, fast load cartridge	$CALL
C Power, C compiler	$36.95
CADPIC	$36.95
Cashbox	$32.95
Wordpro 64	$32.95
Spellpro 64	$32.95
Profile 64	$49.95
PAL 64	
POWER 64	
TOOLBOX 64	

UTILITIES

Merlin 64	$34.95
Fast Load	$24.95
Vorpal fast loader	$CALL
Quest Stat manager	$34.95
Pal 64	$32.95
Power 64	$32.95
Toolbox 64	$59.95
CSM 1541 align	$34.95
Mach 5	$24.95
C Power	$69.95
Simon's Basic	$39.95

C-64 INTEGRATED PKGS

Vizastar 8k	$79.95
Trio	$CALL
Homepak	$39.95

MISC. HARDWARE

Estes pwr supply for C-64	$54.95
Koalapad	$59.95
Koala Gibson Light pen	$49.95
Naverone 3 Slot expander	$27.95

GRAPHICS

Print Shop	$25.95
Print Shop Companion	$24.95
Graphics Library I, II, or III	$16.95
Newsroom	$34.95
Clip Art I	$19.95
Clip Art II	$CALL
CADPIC	$32.95
Screen Dumper 64	$19.95

FINANCIAL & ACCT.

Softsync Pers Acct	$32.95
Cont Home Acct	$46.95
Timeworks General Ledger, A/R,A/P, Payroll, Invtory ea	$40.95
Cashbox	$36.95
Timeworks Electr. Checkbk	$19.95
Timeworks Money Mgr	$19.95

NEW GAMES FOR CHRISTMAS!!!

ACTIVISION

Star Rank Boxing	$21.95
On Court Tennis	$21.95
GBA basketball 2 on 2	$24.95
I am the 64	$21.95
I am the 128	$24.95
Hacker II	$24.95

ARTWORX

International Hockey	$18.95

AVALON HILL

Spitfire 40	$24.95
Gulfstrike	$22.95

DATA EAST

Commando	$24.95

ELECTRONIC ARTS

Amnesia	$29.95
Arctic Fox	$24.95
Autoduel	$37.95
Bards Tale II	$29.95
Battlefront	$29.95
Marble Madness	$27.95
Moebius	$29.95
Murder Party	$25.95
Ogre	$29.95
Robot Rascals	$29.95
Ultima I	$29.95

EPYX

Temple Trilogy	$29.95
Super Cycle	$29.95
World Games	$29.95

FIREBIRD

Elite	$22.95

INFOCOM

Balley Hoo	$29.95

LANCE HAFNER

Final Four Basketball	$29.95
Basketball, the Pro game	$29.95

MINDSCAPE

Bop-n-Wrestle	$21.95
Infiltrator	$21.95

SIERRA

Championship Boxing	$17.95

SUBLOGIC

Football	$37.95
Pure Stat Baseball	$37.95

ORDERS ONLY...CALL TOLL FREE 1-800-468-9044

tcp

simulations. And software developers have been quick to discover just how flexible this Commodore 64 environment can be.

Flight, Sports, And History

There are several different kinds of simulations available for the 64 and dozens of examples within these categories. For the most part, Commodore simulations fall into three categories: realtime, sports, and historical. Although just about any activity can be simulated, these three categories have generated the most interest among Commodore owners.

Among the realtime simulation programs available for the 64, flight simulators are the most popular. A quick look at "A Buyer's Guide to Commodore 64 Simulation Software," accompanying this article, shows just how many of the simulations are based on flying.

Some of them, such as SubLOGIC's *Flight Simulator II*, MicroProse's *F-15 Strike Eagle*, and Microsoft's *Flight Simulator*, have been on software best-seller lists for a year or two and show no signs of disappearing.

Although the first commercial flight-simulation machine was created and used as far back as 1929, it wasn't until the mid-1970s that computers actually became powerful enough to allow simulation systems based on computerized images. Now, little more than a decade later, the flight simulators available for the Commodore 64 and 128 surpass the capabilities of the mainframe systems used in the 1970s.

What's the allure of these flying simulations? The chance to experience the thrill of flying—without the expense and danger—is a powerful attraction in this airborne age. But the flight-simulation packages also offer much more. When you're in the cockpit of a World War II fighter or bomber, and are given a variety of specific challenges, suddenly the simulation is also a game.

Although most of these games trade off differing degrees of realism for easier and more interesting game play, there seems to be something for just about everyone—from the would-be pilot who wants nothing but realism to the game buff who's willing to sacrifice a bit of the rigors of flying in order to enjoy the entertainment of combat simulations.

In fact, a new genre is emerging based on these flight simulators. Two recent best-selling books, *40 Great Flight Simulator Adventures* and its sequel, *40 More Great Flight Simulator Adventures*, (COMPUTE! Books) offer custom-made flying excursions complete with sightseeing and flying adventures.

But flight's not the only subject of realtime simulations for Commodore owners. MicroProse Software, which produces more realtime simulations than any other software publisher, also offers you the chance to command a submarine, an attack helicopter, an acrobatic jet, and even an airport control tower.

MicroProse, which prides itself on the realism of its simulation programs, even offers its *F-15 Strike Eagle* owners the chance to recreate the April 1986 bombing attack by American F-111's against Libya. But, as the company's ads have stated, "the best part is...no one gets hurt."

Sports and historical recreations are also among the most popular topics for Commodore simulation programs. Almost any listing of the top-20 best-selling Commodore entertainment software will reveal that almost half of the products fall into the categories of realtime, sports, or historical simulations.

Most of the historical simulations available for Commodore owners are based on strategy war games, a genre that grew out of the earlier board games before the emergence of computers. Dominating this category is Strategic Simulations (SSI), which has some 30 computer strategy games in its Commodore product line. The subjects range from up-to-date themes such as *Germany 1985* and *Geopolitique 1990* to such historical topics as the Old West recreation, *Six-Gun Shootout*, and the Civil War's *Battle of Antietam*.

A variety of other companies also offer strategic war games, including MicroProse, Avalon Hill, and SSG. Although World War II forms the backdrop for most of these strategy games, just about any period of history can be targeted. Vietnam, for example, is the subject of a growing number of games, including MicroProse's *Conflict in Vietnam* and SSI's *NAM* (see review elsewhere in this issue).

Sports simulations for the Commodore 64 usually fall into one of two categories: arcade-action games, in which fast reflexes with a joystick are paramount, and strategy games, which are closer in style to war games.

An entire series of popular fast-action sports games, originally based on Olympic events such as pole vaulting, track, and swimming, has been produced by Epyx. *Summer Games* and its sequels (*Summer Games II*, *Winter Games*, and *World Games*) feature a variety of contests in each package, colorful graphics, and sound effects.

Others in this genre have concentrated on different sports. Access Software's *Leader Board* is an action golf simulation and Accolade's *Hardball* is an action baseball simulation. There are karate simulations that have grown out of the popularity of martial-arts instruction, including Data East's *Karate Champ* and *Kung Fu Master*, and Epyx's *World Karate Championship*.

In fact, as a glance at the accompanying guide to simulations shows, just about any sport, from bowling and boxing to football and tennis, can be the subject of a simulation game.

Sports strategy games for the Commodore 64 have often evolved from earlier board games in much the same manner as the computerized war games. With baseball and football fans eager to recreate their favorite teams and seasons, the strategy games in these two areas have fared especially well.

SubLOGIC's *Football* and the new *Pure-Stat Baseball*, Epyx's *The World's Greatest Baseball Game*, and Gamestar/Activision's *Championship Baseball '86* are just a few of the popular sports simulations.

Although new simulations—realtime, historical, and sports—crop up every day, Commodore owners always seem ready for one more good program in their particular areas of interest. Other topics haven't generated as much enthusiasm in the Commodore market as these three. But with an installed base of several million 64s and 128s, there are likely to be new categories and topics available in the future. ■

Tokyo for $19.95

東京

In the continuing evolution of scenery, SubLOGIC introduces the Japan and San Francisco Bay Area Scenery Disks for Flight Simulator II and Jet.

- Tokyo to Osaka is a comfortable 240-mile flight. The natural beauty of the Japanese coastline and mountain ranges complement the standard cross-country details.

- The beautiful San Francisco Bay Area "Star" Scenery Disk is perfect for concentrated sight-seeing.

- For the cross-country adventurer, our standard Western U.S. scenery (Disks 1-6) contains major airports, nav-aids, cities, highways, rivers, lakes, and mountains.

SubLOGIC Scenery Disks are available individually for $19.95. The six-disk Western U.S. set is available for $99.95. See your dealer, or write or call SubLOGIC for more information.

subLOGIC Corporation
713 Edgebrook Drive
Champaign IL 61820
(217) 359-8482 Telex: 206995

Order Line: (800) 637-4983
(except in Illinois, Alaska, and Hawaii)

A Buyer's Guide To Commodore 64 Simulation Software

Prices for the following simulation programs generally range from about $20 to $50, depending on the company and the product.

Ace of Aces
Accolade—This World War II aerial-warfare game lets you pilot an RAF Mosquito in the skies over Europe.

Acro-Jet
MicroProse—Up to four players compete in aerial acrobatics in a simulated BD5-J one-man jet.

The American Challenge: A Sailing Simulation
Mindscape—A sailing simulation that lets you learn the rudiments of sailing and then compete for the America's Cup.

Baltic 1985
SSI—Part of SSI's When Superpowers Collide strategy series; NATO forces attempt to rescue troops trapped in West Berlin.

Battalion Commander
SSI—A realtime strategy game as you command U.S., Soviet, or Chinese troops.

Battle for Normandy
SSI—You're in command of the Allied forces on D-Day in World War II in this strategy game.

Battlefront
SSG/Electronic Arts—You're a corps commander in World War II in this recreation of four major land battles in Crete, Stalingrad, Saipan, and Bastogne.

Battlegroup
SSI—A strategy game depicting armored combat on the Western Front in World War II.

Battle of Antietam
SSI—A strategy game recreating the famous Civil War battle.

Breakthrough in the Ardennes
SSI—A detailed recreation of the Battle of the Bulge during World War II.

Broadsides
SSI—In this strategy game, you're the captain of an eighteenth-century warship during the age of fighting sail.

Carrier Force
SSI—This is a simulation of four major naval battles between the U.S. and Japan in the Pacific.

Carriers at War
SSG/Electronic Arts—A recreation of the crucial naval battles in the Pacific during World War II.

Cartels and Cutthroats
SSI—A business simulation that lets you run a major corporation.

Championship Baseball '86
Gamestar/Activision—A new major league baseball simulation game.

Championship Golf at Pebble Beach
Sportsware—A professional golf simulation, with a choice of 14 different clubs, two skill levels, and optional data disks for two more courses.

Colonial Conquest
SSI—A strategy game of world domination set during the Age of Imperialism in the late nineteenth and early twentieth centuries.

Combat Leader
SSI—You can take command as company commander, platoon leader, or squad leader in this strategy simulation of tank warfare.

Computer Ambush
SSI—In this simulation, you take charge of ten American or German soldiers in hand-to-hand combat.

Computer Baseball
SSI—A strategy game featuring major league baseball teams, with optional team disks for different years.

Computer Quarterback
SSI—A strategy game featuring major league football teams, with optional team disks for different years.

Conflict in Vietnam
MicroProse—Five different battle scenarios from the Vietnam War are covered in this strategy game.

Crusade in Europe
MicroProse—From D-Day to the Battle of the Bulge, you're in command in this World War II strategic simulation game.

Decision in the Desert
MicroProse—A strategic recreation of warfare in North Africa during World War II.

Destroyer Escort
MicroProse—The waters of the North Atlantic are the battleground for this strategic simulation of convoy-escort situations in World War II.

Dreadnoughts
Avalon Hill—It's the Royal Navy versus the awesome German Bismarck in this World War II naval-strategy game.

Eagles
SSI—You're the pilot of such World War I planes as the Sopwith Camel or the Fokker Triplane in this aerial-combat simulation.

Europe Ablaze
SSG/Electronic Arts—This is a simulation strategy game of the air war over England and Germany during World War II.

F-15 Strike Eagle
MicroProse—A sophisticated and popular jet-fighter flight simulator with combat scenarios, including the April 1986 bombing raid on Libya.

Field of Fire
SSI—This strategy game puts you in command of Easy Company in eight historical battles of World War II.

Fighter Command
SSI—A detailed air-combat strategy game about the Battle of Britain during World War II.

Fight Night
Accolade—This action boxing game includes a construction set that lets you build your own fighters.

Flight Simulator II
SubLOGIC—This is a realistic flight-simulation program that features a variety of scenarios and options.

Football
SubLOGIC—A realistic football simulation that features both strategy and action.

GATO
Spectrum Holobyte—A World War II submarine simulation, with eight different missions, five difficulty levels, and three ships.

GBA Championship Basketball
Gamestar/Activision—A two-on-two fast-action basketball simulation with a four-division, 23-team league.

Geopolitique 1990
SSI—A political, economic, and military strategy game in which you battle the computer for world dominance.

Germany 1985
SSI—The first game in SSI's When Superpowers Collide series; you're in charge of NATO forces repelling an attack by Warsaw Pact troops.

Gettysburg: The Turning Point
SSI—Basic, intermediate, and advanced levels of play are a part of this historically accurate recreation of the famous battle of Gettysburg in the American Civil War.

Guderian
Avalon Hill—This is a simulation of the German campaign in Russia during World War II, recreating the 1941 attack on Smolensk.

Gulf Strike
Avalon Hill—A strategic simulation of land, sea, and air war in the Middle East.

Gunship
MicroProse—A realistic simulation of the Apache AH-64A attack helicopter, with advanced offensive and defensive weaponry.

The Halley Project: A Mission in Our Solar System
Mindscape—An educational realtime simulation of the solar system, with missions for players to undertake.

Hardball
Accolade—A fast-action graphically oriented baseball simulation.

Hellcat Ace
MicroProse—This is an aerial-combat simulation among fighter planes in the Pacific Theatre during World War II.

Continued

You smirk. Your opponent winces. You bow. So does he. The *World Karate Championship*™ begins.

One or two players. Apple II & compatibles, Atari 800/130, C64/128, IBM & compatibles

Practice long enough and your fingers will be registered as lethal weapons.

Slowly, ever so slowly, you approach. He flinches, and you make a combination front punch and kick.

You spin, then do a reverse kick. A forward flip. You kick again, only higher. Bang. It connects. Lights out.

This time, you survived in one piece.

You'll have 17 intricate moves to master.

As you progress, you'll fight your way from white to black belt in 8 deadly, international settings. With a final, championship match at the base of Mt. Fuji.

See you at the Dojo.

SMASH SOMEONE'S FACE IN THE COMFORT OF YOUR OWN HOME.

It's the Sultans of Slam. The Gurus of Gashes. The meanest, nastiest rowdies to ever hit the canvas. Ladies and not-so-Gentlemen, we proudly present the vile, irreputable stars of *Championship Wrestling.*™

These animals use every trick known to man. And a few that aren't.

There are 8 of these creeps in all, each with their own disgusting personalities and revolting habits.

Throw them from the ring. Crush their heads. Slam them to the mat. Pulverize their puny bones. You'll have over 25 moves to pin your man. You'll need over 250 stitches if you don't.

And one day, after your poor battered head resembles an over-cooked cabbage, you'll be good enough to win the title. And the Championship Wrestling Belt will be yours.

EPYX

One to eight players. Apple II & compatibles, Atari ST, C64/128.

Jet

SubLOGIC—You pilot one of two jet fighters through a variety of scenarios.

Jet Combat Simulator

Epyx—A flight simulator based on the McDonnell Douglas F-15 Eagle that includes flight scenarios and air-to-air combat.

Kampfgruppe

SSI—Warfare on the Russian Front during World War II is the subject of this strategy simulation.

Karate Champ

Data East—An arcade-action martial-arts simulation game.

Kennedy Approach

MicroProse—A realistic air traffic–control simulation that includes speech synthesis and a variety of air-control situations.

Knights of the Desert

SSI—This is a strategy simulation of the tank warfare in North Africa during World War II.

Kung-Fu Master

Data East—An arcade-action martial-arts simulation game.

Leader Board

Access—A golf simulation game featuring excellent graphics and sound effects.

Mech Brigade

SSI—A strategy simulation of armored warfare during the 1990s.

MIG Alley Ace

MicroProse—You're in command during sabre-jet aerial dog fighting in an air-to-air combat simulation.

Monday Morning Manager

TK Computer Products—A strategy baseball simulation with 64 major league teams and over 1500 players and pitchers.

NAM

SSI—This is a combat simulation game set in the jungles of Vietnam.

NATO Commander

MicroProse—Take charge of NATO and defend Europe against a Soviet invasion in this strategic simulation game.

Norway 1985

SSI—The last strategy simulation in SSI's When Superpowers Collide series; NATO guerrillas battle Soviet armor in Norway.

On-Court Tennis

Gamestar/Activision—An action tennis simulation game.

On-Field Football

Gamestar/Activision—An action football simulation game.

Operation Market Garden

SSI—You command the Allied airborne divisions during the 1944 effort to secure six bridges that will allow your troops to cross into Germany.

Operation Whirlwind

Brøderbund Software—A battle action game at the battalion level during World War II.

Panzer Grenadier

SSI—A strategy simulation of warfare on the Eastern Front during World War II, with you in command of German elite armored infantry.

Panzers East!

Avalon Hill—A strategy game recreating warfare on the Eastern Front during World War II.

President Elect

SSI—An educational simulation that lets you manage a nine-week campaign for the Presidency.

Professional Tour Golf

SSI—An action simulation of professional golf.

Pro-Golf

Mastertronic—An action professional golf simulation.

Pure-Stat Baseball

SubLOGIC—Baseball statistics fans can have a field day with this major league baseball simulation.

Rails West!

SSI—You're trying to wheel and deal your way to building a transcontinental railroad in this nineteenth-century business simulation.

RDF 1985

SSI—One of the When Superpowers Collide series from SSI; you command the U.S. Rapid Deployment Force in retaking Soviet-captured oilfields in the Middle East.

Ringside Seat

SSI—An action simulation of professional boxing that allows you to match the pros from past and present.

Silent Service

MicroProse—You're the commander of a submarine in this naval-combat simulation set in the Pacific during World War II.

Six-Gun Shootout

SSI—Direct the actions of Billy the Kid, Wyatt Earp, and other gunslingers in this action strategy game.

Solo Flight

MicroProse—A recently updated flight simulator that includes an instructor-pilot option, software speech synthesis, and new take-off and landing maps.

Space Shuttle

Activision—Subtitled *A Journey into Space*, this is a realistic space-flight simulation based on the space shuttle.

Spitfire Ace

MicroProse—This is an aerial-combat simulation among fighter planes in the European Theatre during World War II.

Spitfire 40

Avalon Hill—A World War II aerial-combat game in which you pilot a Mark I Supermarine Spitfire.

Star League Baseball

Gamestar/Activision—An action baseball simulation game.

Star Rank Boxing

Gamestar/Activision—A fast-action boxing simulation that lets you build up your skills in training camp and then go for the championship.

Statis Pro Baseball

Avalon Hill—A strategy simulation of professional baseball.

Summer Games

Epyx—A fast-action sports game that simulates eight key Olympic events.

Summer Games II

Epyx—A fast-action sports game that simulates eight new Olympic events.

Super Bowl Sunday

Avalon Hill—You're the coach in this professional football simulation that includes 20 different Super Bowl teams; a separate season disk is available also.

TAC

Avalon Hill—Tactical Armor Command, a simulation of World War II armored combat.

10th Frame

Access—A bowling simulation game featuring colorful, detailed graphics.

Tigers in the Snow

SSI—A recreation of the German offensive at the Battle of the Bulge during World War II.

Title Bout

Avalon Hill—A professional boxing simulation game.

Tournament Golf

Avalon Hill—A professional golf simulation game.

USAAF

SSI—A strategy game that recreates the daylight bombing of Nazi-occupied Germany by the United States Army Air Force during World War II.

Wings of War

SSI—Four scenarios in this World War II aerial-combat game let you pilot 36 different fighters and bombers.

Winter Games

Epyx—A fast-action sports game that simulates such winter sports as ski jumping, speed skating, figure skating, and others.

World Games

Epyx—A simulation of eight athletic contests from around the world.

World Karate Championship

Epyx—A fast-action karate simulation that lets players practice and use up to 17 different moves against opponents.

The World's Greatest Baseball Game

Epyx—A recently enhanced version of a strategy sports simulation that features over 75 baseball teams and complete player rosters from the 1984 and 1985 major league seasons.

The World's Greatest Football Game

Epyx—A strategy sports simulation that lets you be both player and coach, designing your own plays and then running them.

Access Software
#A 2561 South 1560 West
Woods Cross, UT 84087

Accolade
20833 Stevens Creek Blvd.
Cupertino, CA 95014

Activision
2350 Bayshore Frontage Rd.
Mountain View, CA 94043

Avalon Hill Game Company
Microcomputer Games Division
4517 Harford Rd.
Baltimore, MD 21214

Brøderbund Software
17 Paul Dr.
San Rafael, CA 94903

Data East USA
470 Gianni St.
Santa Clara, CA 95054

Electronic Arts
1820 Gateway Dr.
San Mateo, CA 94404

Epyx
1043 Kiel Ct.
Sunnyvale, CA 94089

Firebird Licensees
P.O. Box 49
Ramsey, NJ 07446

First Star Software
18 East 41st St.
New York, NY 10017

Mastertronic International
7311B Grove Rd.
Frederick, MD 21701

MicroProse Software
120 Lakefront Dr.
Hunt Valley, MD 21030

Mindscape
3444 Dundee Rd.
Northbrook, IL 60062

Spectrum Holobyte
1050 Walnut
Suite 325
Boulder, CO 80302

Spinnaker Software
One Kendall Square
Cambridge, MA 02139

Sportsware
5234 War Wagon Dr.
San Jose, CA 95136

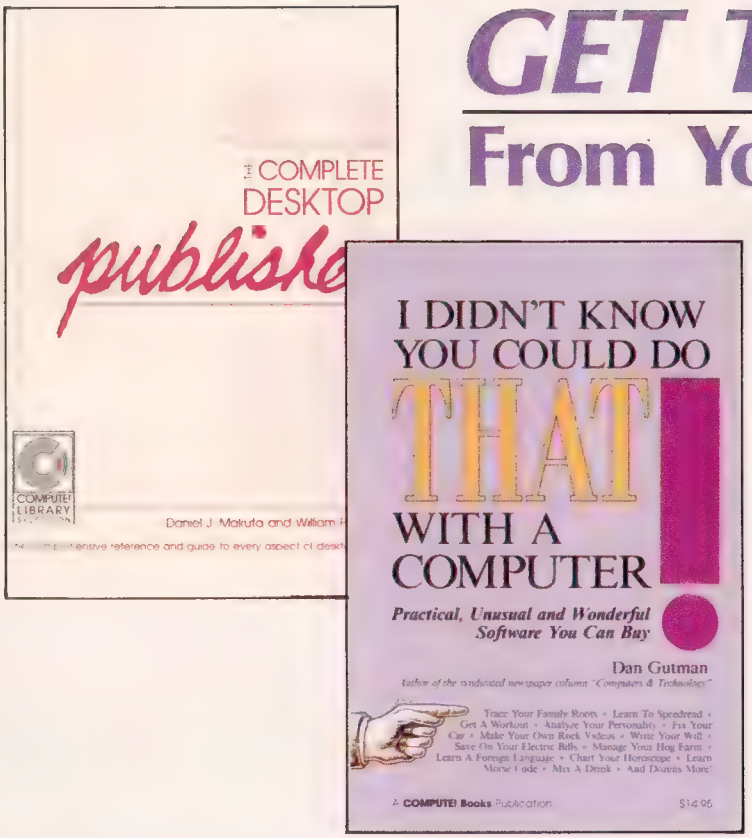
Strategic Simulations (SSI)
1046 N. Rengstorff Ave.
Mountain View, CA 94043

SubLOGIC
713 Edgebrook Dr.
Champaign, IL 61820

Telarium
Spinnaker Software
One Kendall Square
Cambridge, MA 02139

TK Computer Products
P.O. Box 9617
Downers Grove, IL 60515

GET THE MOST
From Your Computer!



Two new books from COMPUTE! bring you innovative ideas to exploit the capabilities of your computer to the fullest and to make use of it in ways you didn't know were possible. There's an in-depth look at desktop publishing—how to get started and how to set up your publication. A compendium of special software tells you where to purchase inexpensive software that will open up a new world of applications. The information is non–machine-specific and is designed for beginning to advanced computer users.

The Complete Desktop Publisher

Daniel J. Makuta and William F. Lawrence

A comprehensive reference and guide to what is fast becoming one of the most popular uses of computers, this book guides the novice through the intricacies of desktop publishing. Clearly written and understandable, this guide covers all the basics of typography, layout, and design. Sample formats and layout grids make it easy to get started. Details on using graphics to enhance publications, discussions of the desktop publishing software currently available, and comparisons of laser printers, typesetters, and other printing devices give you everything you need to make intelligent decisions. Chapters outline the elements of fitting copy, proofreading, binding and folding, and media conversion. You'll also find a wealth of information on telecommunications—how to transmit your publication for typesetting or printing—as well as tips on dealing with outside design agencies, typographers, and printers. The definitive guide.

$19.95 ISBN 0-87455-065-3

I Didn't Know You Could Do *That* with a Computer!

Dan Gutman

There's more to computers than processing words, juggling numbers in a spreadsheet, or filing records in a database. A world of unusual, practical, and amazing computer programs is available which can help you do anything from planting a garden to writing a will. These programs range from the simply fascinating to the outright esoteric. More than 100 little-known, yet intriguing commercial software packages are evaluated and reviewed: programs which can plot your astrological future, show you the night skies, plan your next road trip, help you raise your child, and give you the edge at the racetrack. Entertaining—certainly unique—this book puts an end once and for all to the question "Now that I have a computer, what do I do with it?"

$14.95 ISBN 0-87455-066-1

Look for these books at your local computer or book store.

Or, to order directly from COMPUTE!, call toll-free 800-346-6767 (in NY 212-887-8525), or write COMPUTE! Books, P.O. Box 5038, F.D.R. Station, New York, NY 10150. Please include $2.00 shipping per book for U.S. and surface mail; $5.00 airmail. North Carolina residents add 5 percent sales tax. New York residents add 8.25 percent sales tax.

Please allow 4–6 weeks for delivery.

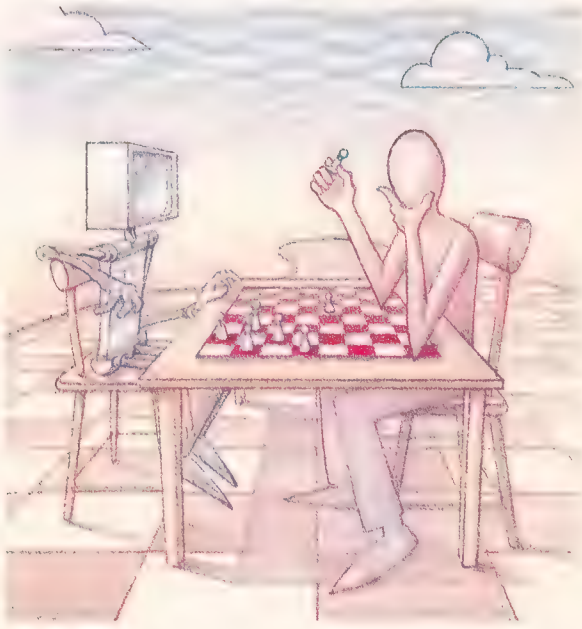
COMPUTE! Publications, Inc.

Part of ABC Consumer Magazines, Inc
One of the ABC Publishing Companies
825 7th Avenue, 6th Floor, New York, NY 10019
Publishers of COMPUTE! COMPUTE!'s Gazette, COMPUTE!'s Gazette Disk, COMPUTE! Books, COMPUTE!'s Apple Applications, and COMPUTE!'s Atari ST Disk and Magazine

COMPUTE! books are available in the U.K., Europe, the Middle East, and Africa from Holt Saunders, Ltd., 1 St. Anne's Road, Eastbourne, East Sussex BN21 3UN, England, and in Canada from McGraw-Hill, Ryerson Ltd., 330 Progress Ave., Scarborough, Ontario, Canada M1P 2Z5.

The 64 As A Game Machine

Kathy Yakal, Assistant Features Editor
Selby Bateman, Features Editor



Almost five years after its introduction, the Commodore 64 continues to be the most popular game machine on the market thanks to its excellent color graphics and three-voice sound chip. This year, numerous software publishers have announced a spate of new entertainment programs for the 64, pushing the machine to even greater capabilities. Here's a look at some of those new products.

Despite the fact that the microcomputer industry got much of its start from the early arcade-game machines and that millions of people bought VCS (video cartridge system) games, many computer users today reserve the term *game machine* as an epithet for a computer with little power.

Happily, Commodore 64 owners have known for a long time that their machines give them the best of both worlds. And the latest 16-bit computer powerhouses like the Commodore Amiga and Atari ST substantiate the fact that a computer can be both a workhorse and an entertainment center.

When the first personal computers began appearing in the late 1970s, there simply wasn't enough power in the machines to generate sophisticated graphics and sound. Hobbyists, programmers, and some small-business owners were thankful just to have the raw computational power in the early Apple, Radio Shack, Commodore PET, Texas Instruments, and other computers. Although games were written and sold for all the early computers, the limited memory and relatively bare-bones hardware made them less than ideal game machines.

Then came the Commodore 64. Though its initial price was near $600, Commodore steadily dropped the price to less than half that amount, and the computer continues to be a bargain today. More than any other personal computer previously introduced, the 64 contained the necessary ingredients to make it a terrific game machine: a three-voice programmable sound chip called SID (Sound Interface Device) that's been described as a synthesizer on a chip, and a color graphics system that includes *sprites*, independently movable objects that overlay the background display.

As sales of the 64 took off during late 1982 and early 1983, software developers responded. Scores of software packages began appearing, and many of them were entertainment programs. But programmers were just beginning to learn that the Commodore 64 offered a development environment too rich to be fully exploited overnight. Today, with some five million 64s sold, game designers have hit their stride. Programmers have learned the 64 inside and out, and are creating sound and graphics effects that the computer's designers would never have dreamed possible.

"The 64 combines the best graphic resolution, the best music

Introducing ActionSoft!

Colonel Jack Declares War to Improve Strategy/Action Software

Colonel Jack Rosenow, President of ActionSoft Corporation, is out to turn the simulation software industry upside down:

"Most current simulations are little more than games," says the Colonel. "They're a far cry from what can be done with modern state-of-the-art graphics technology. They have limited strategic depth and a limited sense of realism. That's why ActionSoft Corporation was created. We're going to redefine the state of the art in simulation software.

"My own area of expertise is military helicopters - their flight characteristics, and their deployment on the battlefield. We've assembled a collection of experts in other fields (combat strategists, fighter pilots, submarine commanders) to help us develop the most realistic strategy/action simulations ever seen.

"ActionSoft puts you at the center of the action. We take you from the depths of the Pacific ocean to the infinite frontiers of space. And with the incredible 3D graphics/animation technology provided by SubLOGIC, our products draw you into the simulation like never before. Up to now this type of realism has been available only on the most expensive military simulators. We're making it available to everyone.

"Our first product is Up Periscope!, a WWII fleet class submarine simulator for Commodore 64/128 and Apple II computers. Up Periscope! is available for the suggested retail price of $29.95.

"Next up is ThunderChopper, a high-performance scout/rescue/attack helicopter simulator. ThunderChopper is also available for the C64/128 and Apple II computers for $29.95."

Colonel Jack Declares War on Inflated Software Prices

"My motto has always been 'Better Quality at a Better Price'. ActionSoft simulations are generations ahead in strategy, action, and technology. And at $29.95, they're also priced less than the competition.

"Why pay more for a second-rate simulation when you can have the best for less? ActionSoft simulation software sets the new price/performance standard against which all other simulations must now be judged. But don't just take my word for it. Try ActionSoft - you'll be convinced."

Colonel Jack Rosenow, USAF (Ret)

Captain John Patten's years of US Navy experience provide the realism and submarine combat strategy of Up Periscope!

Colonel Jack's 9000-plus hours of flight time are put to good use in the development of Thunder-Chopper!

ACTION Soft
GENERATIONS AHEAD IN STRATEGY/ACTION SOFTWARE
122-4 S. RACE ST. URBANA, IL 61801
(217) 367-1024

Don't buy another submarine simulation (like Silent Service or G[illegible] assuming that it comes close to Up Periscope! We think you'll find that the superior strategic play and 3D animated graphics of this simulation put it generations ahead of the pack!

Strategy

You command a WWII fleet class submarine. Patrol the Atlantic and Pacific theatres of war. Take your orders from COMSUBPAC (Commander Submarine Force Pacific), or go hunting on your own.

Captain John Patten's years of US Navy service provide the submarine combat strategy missing from other sub simulations. Successful enemy engagements are conducted in four separate phases:

1. Contact (Determine direction of target motion)
2. Approach (Close to within effective weapons range)
3. Attack (Obtain optimum firing position & avoid detection)
4. Withdraw (Avoid enemy destroyers & aircraft)

Relive eight different historical situations and compare your strategies with those of real submarine commanders. When you master the daytime periscope-depth attack, move on to the dangerous and skill-demanding night surface patrol.

Up Periscope! includes extensive realistic equipment; surface and attack radars, variable-power periscope, torpedo data computer, and much more. Armament supplies include everything from a selection of old reliable Mark 10s to advanced wakeless (but unproven) Mark 18 torpedoes that can be fired from both fore and aft torpedo tubes.

Graphics and Animation

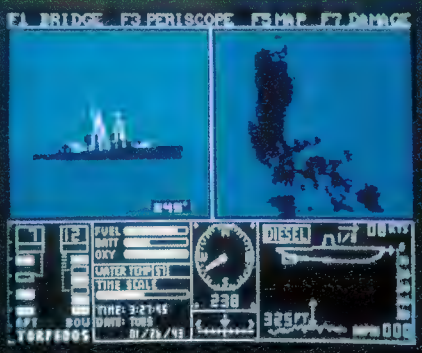
Allied and enemy ships are depicted in truly unprecedented 3D detail, courtesy of SubLOGIC graphics and animation technology. Potential targets include enemy freighters, tankers, troop ships, destroyers, and battleships, plus various friendly forces. A complete instrument panel and split-screen views let you scan all vital information at a glance during the heat of battle.

All major land masses and islands (and even a few minor ones) are properly located. Use detailed Pacific and Atlantic charts to plot your course and navigate right to the action. But be careful not to get rammed or depth-charged by enemy ships. And try to avoid the embarrassment of sinking one of your own Allied ships or running aground on an uncharted Pacific atoll.

For true submarine action and realism, nothing else compares with Up Periscope!

Up Periscope!

Simulation animation and 3D
graphic technologies licensed from SubLOGIC



See Your Dealer...
Or write or call us for more information. Up Periscope! is available on disk for the Commodore 64/128 and Apple II computers for a suggested retail price of $29.95. For direct orders please specify which computer version you want. Include $2.00 for shipping and specify UPS or first class mail delivery. Visa, MasterCard, American Express, and Diners Club cards accepted.

Captain John Patten, USN (Ret)

- $29.95 -
Better Engineering at a Better Price

© 1986 ActionSoft Corporation
3D Graphics and special effects courtesy
SubLOGIC Corp. Electronic Boat Division

Commodore 64 and Commodore 128 are
trademarks of Commodore Electronics, Ltd.
Apple II is a trademark of Apple Computer, Inc.

ACTION Soft
"GENERATIONS AHEAD IN STRATEGY/ACTION SOFTWARE"
122-4 S. RACE ST. URBANA, IL 61801
(217) 367-1024

capability, and is the easiest for our design teams to work with in development," says Tom Frisina, president of Accolade Software, a relatively young software company that's produced a variety of popular 64 game titles over the past year and a half.

"We've all recognized that the 64 still offers a degree of realism and perceived sophistication that can really impress end users who are buying new software for their existing 64s, or buying new Commodore machines," he adds.

Electronic Arts, a longtime leader in entertainment software, is one of the companies offering a number of new 64 packages this year. And Bing Gordon, EA's vice president of sales and marketing, agrees that the 64 is a terrific game machine. "The Commodore 64 is the IBM of home computing; no one thinks you're dumb if you buy it. And Commodore is the only manufacturer that doesn't mind saying that games are an OK thing."

With strong sales of the new 64C computer, and continued popularity of the Commodore 128 computer, many of the software companies supporting the 64 are predicting a period of extended software support. And that support is strongest in the area of games.

"We're selling to a very large base of Commodore 64s out there, and it's a base that's traditionally very active in game software," says Robert Botch, vice president of marketing for Epyx, a software company that's given longtime support to the 64 and that currently has some 25 Commodore titles available.

"We're betting on the fact that even if Commodore stopped selling the 64 this Christmas, we'd still have a good 12 months. After the first 12 months, you'd see companies like Epyx bringing out less, but not going away from the 64—maybe bringing out about half as many titles.

> ***"Programmers have learned the 64 inside and out, and are creating sound and graphics effects that the computer's designers would never have dreamed possible."***

One of the views from the cockpit in Accolade's Ace of Aces, *an aerial combat game.*

Chessmaster 2000 *for the 64 offers both 3-D and 2-D screens.*

"It [continued software support of the 64] could be as long as three or maybe four more years," he says. "An awful lot depends on the consumers."

The following titles are among the newest Commodore 64 games, many of which demonstrate the latest techniques exploiting the machine's graphics and sound capabilities.

Ace of Aces (Accolade)—As the pilot of an RAF Mosquito during World War II, you're battling enemy fighters, bombers, V-1 rockets, German U-boats, and more in a game that showcases the 64's graphics and sound effects.

Amnesia (Electronic Arts)—This is a huge all-text adventure, written by science-fiction author Thomas M. Disch. More than 4000 locations in Manhattan, including the city's subway system, are a part of your search to regain your identity and find out why people are out to get you.

Arch-Mage's Tale: Bard's Tale II (Electronic Arts)—This sequel to the fantasy role-playing game, *The Bard's Tale*, offers an even bigger playing environment, including seven different cities to explore and many new spells and characters.

Battlefront (Strategic Studies Group/Electronic Arts)—This recreation of four different land battles of World War II also includes a design kit to let you customize your own games.

Breakers (Brøderbund)—A 1500-word vocabulary is a part of this science-fiction text adventure and makes it possible for the program to interpret the ordinary English sentences you type in. It's also a *real-time* game, meaning that characters move about and situations change even when you're doing nothing.

Chessmaster 2000 (Software Country/Electronic Arts)—A powerful chess competition program, this

A rare species of interactive illustrated fiction for the Commodore 64/128™, Amiga™ and Atari 520st™

This illustrated adventure is destined to rival all the classics. Stunning graphics are the icing on the cake – but underneath lies the most advanced text operating system yet developed.

ATARI ST SCREENSHOT

The story is absorbing, humorous, lively, full of intrigue and puzzle, yet subtle enough to appeal to the beginner and the hardened adventurer alike.

'The Pawn' understands **plain English,** it knows the size, volume and weight of the game objects, their texture, and their magical properties (in fact the program stores 135 pieces of information for each object).

ATARI ST SCREENSHOT

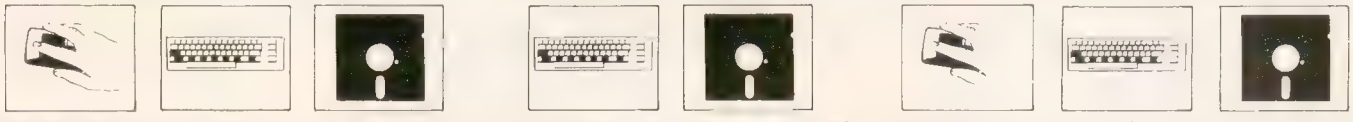
The game is **truly** interactive, each character in the plot has a personality (even the animals!) and will respond intelligently to conversation...

'The Pawn' and further adventures will be available for all leading personal computers.

Guaranteed to make a major impact on the market.

FIREBIRD HOTLINE ☎ 201 934 7373

COMMODORE AMIGA™ COMMODORE 64/128™ ATARI 520ST™



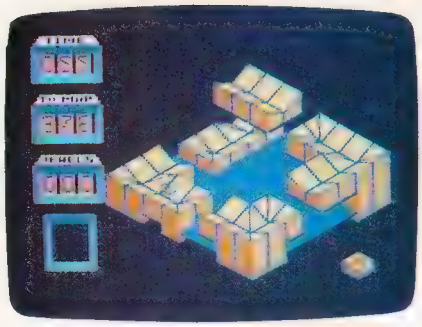
COMMODORE 64/128 AND COMMODORE AMIGA ARE TRADE MARKS OF COMMODORE BUSINESS MACHINES ATARI 520ST IS A TRADE MARK OF THE ATARI CORPORATION

game offers a variety of levels, two- and three-dimensional boards, and a host of other features.

Deceptor (Accolade)—Six levels of mazes keep you occupied as you maneuver and alter your robotic vehicle from screen to screen in this fast-action game. You can even set the game to react to your own level of responses.

Destroyer Escort (MicroProse)—Historical accuracy and realistic details are a part of this World War II simulation of convoy escort duties in the North Atlantic. Ship speeds, weapons, damage assessments, and tactics are all a part of game play.

Electric Dreams Series (Activision)—The first three games in this new series, all previously top hits in the British software market, include *The Rocky Horror Picture Show*, a fast-action game based on the popular movie; *Spindizzy*, a colorful action game with 386 different screens for you to conquer; and *Zoids*, an action-adventure game based on the popular Tomy television and toy characters.



Activision's Spindizzy *offers almost 400 different screens to navigate as you try to map an unknown world.*

You're closing in on a target in this screen from Gunship, *an attack-helicopter simulation from MicroProse.*

Fairlight (Mindscape)—It's up to you to restore the magic in the land of Fairlight in this adventure that also features three-dimensional graphics.

Gunship (MicroProse)—You're at the controls of an AH-64A Apache attack helicopter, with everything from zoom television gun sights and laser range finders to rocket pods and laser missiles.

Hacker II: The Doomsday Papers (Activision)—This sequel to the popular original, contains an even more challenging scenario. You've got to break the Soviet Union's computer security system in order to save the U.S.

Marauder (Mastertronic)—One of the latest low-cost games from Mastertronic, a British publisher that offers a variety of arcade-action hits for the 64.

Marble Madness (Electronic Arts)—This arcade hit is now in a version for the 64, with mazes and a host of obstacles for you to maneuver over, around, and through.

Infocom introduces four new gam

Infocom,™ the crazy people who brought you "Zork"® and "The Hitchhiker's Guide to the Galaxy,"™ has a habit of coming up with games that add a new dimension to interactive fiction. And the best keeps getting better. Case in point: "Leather Goddesses of Phobos."™ It has a scratch n' sniff card and a 3-d comic book to excite all your senses. Once your interest is piqued, you'll embark on a rowdy romp through the solar system. This hilarious spoof of 1930's pulp science fiction has 3 "naughtiness levels," for the prude to the lewd. "Leather Goddesses" is sure to amuse members of either sex.

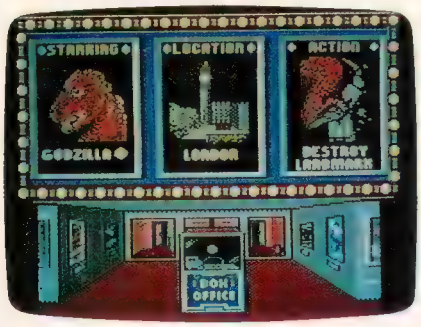
One's really warped.

Then there's "Trinity."™ It answers the question of whether a game can be both light-hearted and profound. You journey through a time warp into a mischievous fantasy world where all atomic explosions are mysteriously connected. "Trinity" takes you back to the dawn of the atomic age and puts the course of history in your hands.

One's a real circus.

It has been said that the circus is the only really mysterious thing left in civilization. One thing's for sure, there is plenty of mystery in "Ballyhoo."™ While trying to locate the circus owner's kidnapped daughter, you are somersaulted into a three-ring world of deception and crime. To solve the crime

Moonmist (Infocom/Activision)—Infocom's reputation in the all-text adventure field is well known, and this new introductory-level game carries on the tradition. You're an amateur sleuth trying to discover a ghost and a hidden treasure in Tresyllian Castle.



The Movie Monster Game *from Epyx turns you into a real monster.*

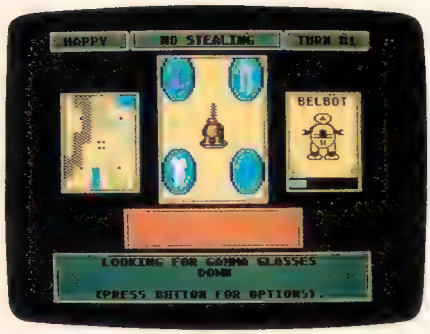
The Movie Monster Game (Epyx)—As one of several different movie monsters, you can cause mayhem and hysteria in the world's most famous cities, just by breathing and walking around. The game features colorful graphics, sound effects, and a funny scenario.

Murder Party (Electronic Arts)—You're the host of a murder party, trying to determine who did what to whom. Up to seven people can play, and the game generates all of the clues and culprits, which change from game to game.

Ogre (Electronic Arts)—A Commodore 64 version of the popular board game, *Ogre*, this program pits a supertank against conventional armed forces. You can take either side, and there are ten different playing fields.

Pure-Stat Baseball (SubLOGIC)—Baseball fans will have plenty to work with in this statistical simulation for one or two players. Any team from the 1985 season, plus eight classic teams from the past, can be used. You can also build your own teams and play in one of three different stadiums. A separate stadium disk is also available that features every major league ball park.

Robot Rascals (Electronic Arts)—From two to four players can take part in this robotic scavenger hunt that's half board game and half computer game. The program was developed by Ozark Softscape, the group that created the popular *M.U.L.E.*, *Seven Cities of Gold*, and *Heart of Africa*.

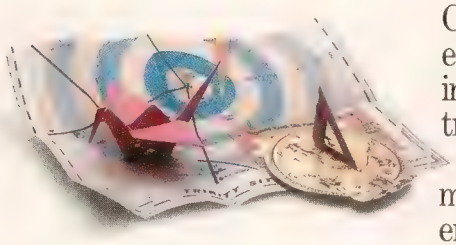


Electronic Arts' new Robot Rascals *is a Commodore 64 scavenger hunt game for two to four players, from the creators of* Seven Cities of Gold.

The Scoop (Telarium/Spinnaker)—This Commodore 128 game is a graphics and text adventure that's based on an Agatha Christie story. As a newspaper reporter, you attempt to solve the murder and get the scoop.

Spitfire 40 (Avalon Hill)—This is an aerial-combat game and a flight

es. One really smells.



Every package includes an integral set of props to excite your senses and enhance the game.

and save your hide from a permanent spot in the freak show, you'll need to stretch your puzzle-solving skills to the limit.

One's really haunting.

Wrapping up this new quartet is a classic gothic mystery set in a haunted castle on the mist-shrouded seacoast of Cornwall. In "Moonmist"™ you'll explore the darkest reaches of Tresyllian Castle and get involved with an eccentric cast of characters, including British nobility, while trying to save your best friend from a vengeful ghost. "Moonmist" offers four distinctly different sets of clues, problems, solutions and hidden treasures. So you'll die to replay it again and again.

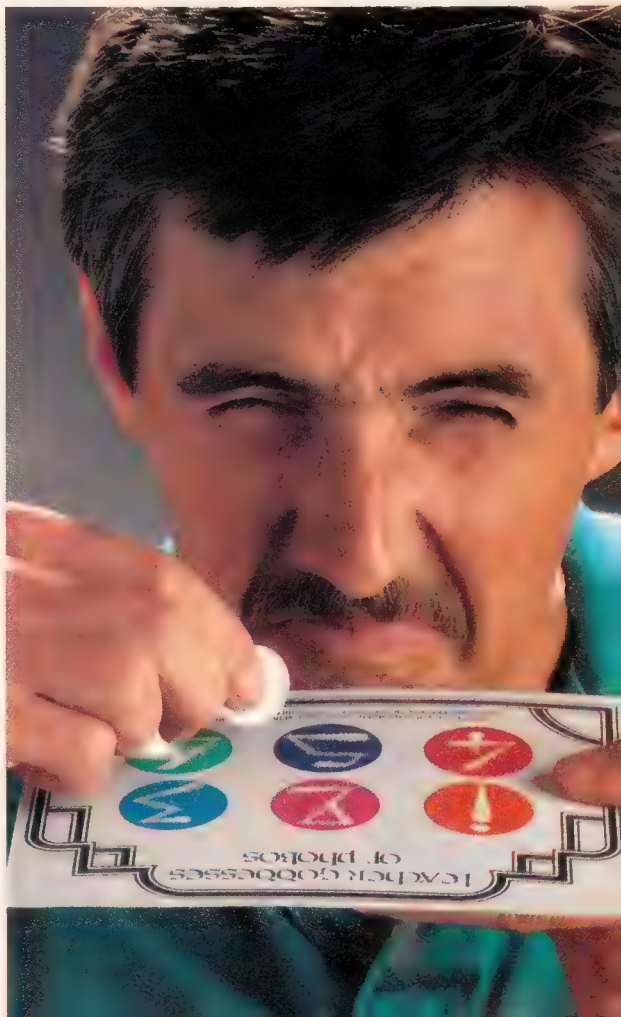
All four are easy to get.

Simply follow your nose to your local software store today.

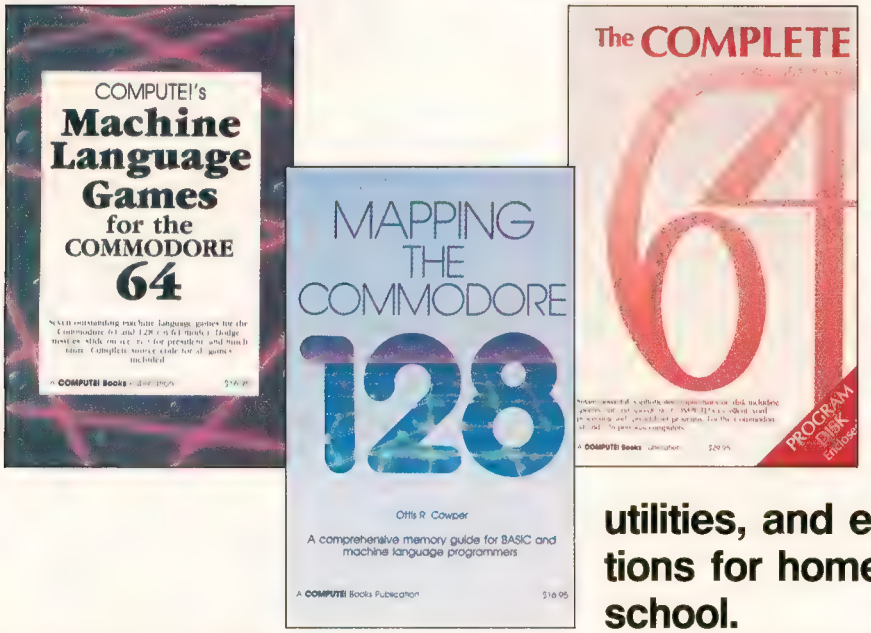
INFOCOM™

For more information, call 1-800-262-6868, x. 17F. Or write to us at 125 CambridgePark Drive, Cambridge, MA 02140.

© Infocom, Inc. Zork is a registered trademark and Ballyhoo, Trinity, Leather Goddesses of Phobos and Moonmist are trademarks of Infocom, Inc. The Hitchhiker's Guide to the Galaxy is a trademark of Douglas Adams.



Calling All COMMODORE Users!


COMPUTE!'s
Machine Language Games for the COMMODORE 64
MAPPING THE COMMODORE 128
Ottis R. Cowper
A comprehensive memory guide for BASIC and machine language programmers
The COMPLETE 64
PROGRAM DISK Enclosed

Three new books from COMPUTE! bring you fully tested and completely documented machine language programming tutorials, exciting games, valuable utilities, and easy-to-use applications for home, business, and school.

Exceptional new books from COMPUTE! for your 64 and 128.

Mapping the Commodore 128

Ottis R. Cowper

This clearly written, comprehensive memory map and programmer's guide, written by the technical editor of COMPUTE! Publications, provides a detailed explanation of the inner workings of the Commodore 128 computer. Topics include memory management, BASIC 7.0, I/O chip registers, the operating system, system RAM, and much more. This is an important reference for both BASIC and machine language programmers.

$19.95 ISBN 0-87455-060-2

COMPUTE!'s Machine Language Games for the Commodore 64

Edited

This collection of the best machine language games from *COMPUTE!* magazine and *COMPUTE!'s Gazette* is a must for 64 game players and machine language programmers. The book includes both the source code (studying these listings is an excellent way to improve your machine language programming) and object code for the popular games "Cut-off!," "Campaign Manager," "Nessie," "Miami Ice," "Heat Seeker," "Whirlybird," and "Laser Beam." *A disk is available for $12.95 which includes programs in the book, 610BDSK.*

$16.95 ISBN 0-87455-061-0

The Complete 64

Edited

A book/disk combination with seven powerful, sophisticated applications on disk. The book has complete, easy-to-follow documentation for each of the six applications. It features *SpeedScript* and *SpeedCalc*, COMPUTE!'s commercial-quality word processing and spreadsheet programs; "Plus/Term," an easy-to-use, yet versatile, telecommunications program; and "Sidplayer," a powerful music editor and player. "Hi-Resolution Sketchpad," "Ultra-Font +," and "Mini-filer" are also included. All the applications are on a disk ready to load and use on the Commodore 64 and 128 running in 64 mode.

$29.95 for book/disk package

ISBN 0-87455-062-9

Visit your local book or computer store and ask for one of these new summer releases from COMPUTE! Books.

You can order directly from COMPUTE! by calling toll-free 800-346-6767 (in NY 212-887-8525) or writing COMPUTE! Books, P.O. Box 5038, F.D.R. Station, New York, NY 10150.

Please include $2.00 per book or disk for shipping and handling in U.S. and surface mail or $5.00 per book airmail. NC residents add 5 percent sales tax. NY residents add 8.25 percent sales tax.

Please allow 4–6 weeks for delivery.

COMPUTE! Publications, Inc. abc

Part of ABC Consumer Magazines, Inc
One of the ABC Publishing Companies
825 7th Avenue, 6th Floor, New York, NY 10019

Publishers of COMPUTE! COMPUTE!'s Gazette, COMPUTE!'s Gazette Disk, COMPUTE! Books, COMPUTE!'s Apple Applications, and COMPUTE!'s Atari ST Disk and Magazine

COMPUTE! books are available in the U.K., Europe, the Middle East, and Africa from Holt Saunders, Ltd., 1 St. Anne's Road, Eastbourne, East Sussex BN21 3UN, England, and in Canada from McGraw-Hill, Ryerson Ltd., 330 Progress Ave., Scarborough, Ontario, Canada M1P 2Z5.

simulator that puts you in the pilot's seat of a Mark I Supermarine Spitfire during World War II.

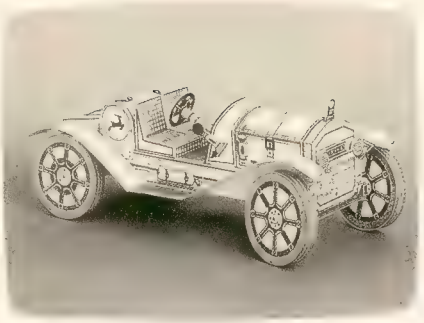
Spy Vs. Spy III: Arctic Antics (First Star)—Detailed color graphics and a clever scenario continue in the latest version of this popular Spy Vs. Spy series based on the *MAD Magazine* cartoon strip.

Starglider (Firebird)—Defend yourself from an invading alien army in this action game that features air-to-air and air-to-ground combat.

Tass Times in Tonetown (Activision)—A strange journey through an alternate universe, this game mixes a humorous and bizarre plot line with excellent graphics and game play.

10th Frame (Access)—From the developers of the *Leader Board* golf simulator for the 64, this is a similar effort featuring the sport of bowling.

The Toy Shop (Brøderbund)—You can build your own customized mechanical toys with this combination computer program and construction kit. Each of the 20 toys included can be made to work, and everything you need is in the kit.

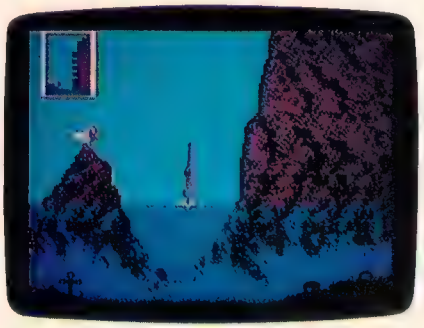


Brøderbund's The Toy Shop *helps you create customized working models of such toys as this 1911 Mercer Raceabout.*

Tracker (Firebird)—You're in command of the TRAC force as you use both strategy and fast-action responses to battle hostile computer-controlled Cycloid fighters.

Transformers: Battle to Save the Earth (Activision)—The popular television and toy Transformer robots are the subject of this action game. The flip side of the game disk contains a visual and verbal history of the Transformer characters that's told through speech synthesis on the 64.

Trinity (Infocom/Activision)—This standard-level text adventure mixes magic and physics, sending you to different time periods and locales around the world as you attempt to change the course of atomic history.



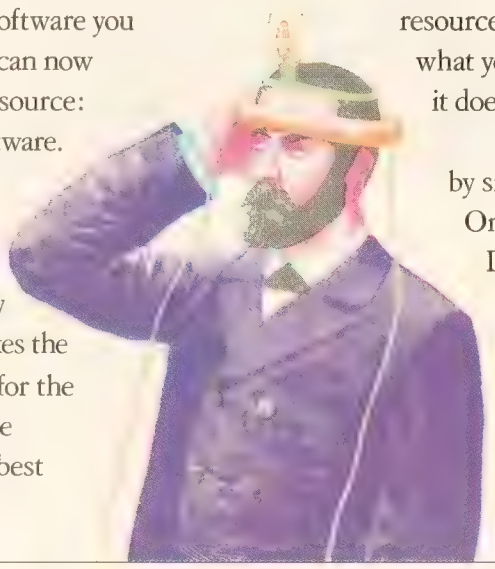
The cliff-diving event in Epyx' World Games *is just one of eight different action contests within this game.*

World Games (Epyx)—Attention to detail and superior color graphics are a part of this fast-action sports simulation that's the latest in a series of such games from Epyx. Eight new athletic events are included, and each sport takes place in a different country.

If you feel like a lost soul when it comes to music software, get the bible.

Almost every bit of music software you could possibly want or need can now be found in a unique single source: Coda, the bible of music software.

Detailing over 500 items which range from software to accessories to books, Coda is a remarkably user-friendly catalog that takes the confusion out of searching for the right music software. It's the computer-using musician's best resource today. In fact, if you can't find what you need in Coda, chances are it doesn't exist.



Order Coda today for only $4.00 by simply calling the number below. Or write to: Wenger Corp., 555 Park Drive, Dept. C1, Owatonna, MN 55060. It's not only inspirational, it's divine guidance.

Coda. 1-800-533-0393.

All major credit cards accepted.
In Minnesota call 1-800-533-6774.
Elsewhere call collect 1-507-451-3010.

Q-Bird

Mike Sedore

This delightful and colorful arcade-style game for the Commodore 64 challenges your character, a defenseless (but nimble) baby bluebird, to survive among a crew of nasty, hungry enemies. A joystick is required.

Other birds say you're paranoid, but you're not—everyone really *is* out to get you. You often ask yourself how long a defenseless baby bluebird can hope to survive when a host of voracious predators are looking for a meal. If only you could leave this place to find a new home. But alas—you're too young to fly. The best you can manage is a flapping long jump. But you'd better be careful not to jump too far: You could fall a long way down.

Typing It In

Since "Q-Bird" is written entirely in machine language, you'll need to type it in with "MLX," the machine language entry program found elsewhere in this issue. When you run MLX, you'll be prompted for a starting address and an ending address for the data you'll be entering. For Q-Bird, use the following addresses:

Starting address: 0801
Ending address: 19A8

Be sure to save a copy to disk or tape when you've finished typing. Although Q-Bird is written in machine language, it can be loaded and run like a BASIC program. To play, type LOAD *"filename"*,8 (for disk) or LOAD *"filename"*,1 (for tape). When it's finished loading, type RUN to start the game.

Q-Bird is played on a 6 × 7 grid. There are 15 levels of play from which to choose. As you play, you advance level by level by completing grids. A grid is complete when the color of each square matches the goal color shown at the bottom of the screen. To change the color of a square, simply hop on it. You have to jump on each square once in level 1, twice in level 2, and so on up to level 15. A bonus life is awarded each time you complete a level. If you reach level 15, you should feel satisfied. It doesn't get any harder than this. But don't relax; it doesn't get any easier either.

You'd better keep moving if you want to stay alive in this colorful 3-D action game.

You start with five lives. Choose your starting level by pushing forward on the joystick (which must be plugged into port 2). If you pass the level you want to play, pull back on the stick to reverse the level counter. Press the fire button to begin play. To hop, simply move the joystick in the direction you want to go. For a super jump, push the fire button as you hop: You'll leap over a square and land on the next. If you time it right, you can leap right over your enemies. But be careful not to jump over the side of the grid. That costs one life.

Press SHIFT–LOCK to pause the game. To restart a game, press RUN/STOP–RESTORE.

Leapin' Lizards

Three purple lizards live on the grid. They randomly leap off of their tails from square to square, landing on any bluebirds careless enough to get in their way. But they're the least of your worries. There's a king cobra that relentlessly chases you. He's got a hole in his stomach just the size of a baby bluebird. If he doesn't get you, then perhaps the low-flying and hungry hawk will. And while you're looking out for all of these villains, try to dodge the runaway balls that roll down the grid. Any one of them could turn you into a bluebird pancake in a moment.

Fortunately, you do have an ally. Occasionally, a flashing egg appears on a random square. If you hop on it, you momentarily stun all the grid inhabitants. You can now go anywhere you please without harm. Unfortunately, this doesn't last long. When the safe time is nearly through, your character, the bluebird, begins flashing. All action returns to normal after the third flash, so be ready for the frenzy to continue.

See program listing on page 132.

VISIT EXOTIC LANDS AND WIN OVER THE NATIVES.

There is a place, probably a long, long way from where you're sitting right now, where grown men actually wear dresses and throw telephone poles in the air as a sign of athletic prowess.

It is true.

There is another rather bizarre land where grown men actually throw *themselves* in the air as a sign of athletic prowess.

Right off the edge of a cliff.

We're talking, of course, about Scotland's famous Caber Toss and the death-defying divers of Acapulco.

Two of the events you'll find in *World Games*,™ the newest sequel in our bestselling "Games" series.

Here's your chance to dash around the globe as a big-time international athlete competing in 8 extraordinary sports.

Go stomach to stomach with a 400 pound sumo. Jump barrels in Germany.

Anyone who can throw a telephone pole long distance is entitled to wear a dress.

You haven't lived until you've taken a log out for a spin.

Try Canada's ridiculously difficult log roll. Or ski the brutal, wintry slopes of France.

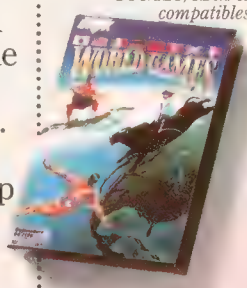
Then it's back to the good old US of A to ride a bucking bull. And off again to bully Moscow with some heavy-duty weight lifting.

If you manage to upset enough countries, your name will be permanently inscribed in the World Hall of Fame.

This then, is a challenge of global proportions.

The question is, are you ready to go the distance?

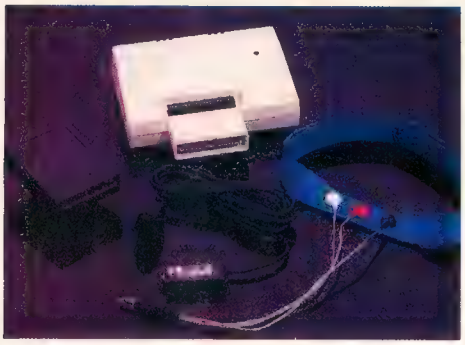
One to eight players. Amiga, Apple II & compatibles, Atari ST, C64/128, IBM & compatibles.



EPYX®

BODYLINK™

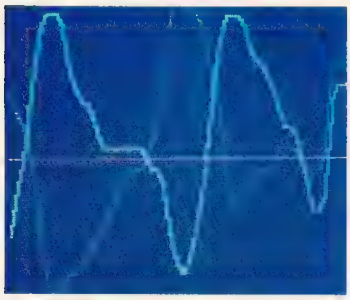
CONVERTS YOUR COMMODORE 64/128 INTO A HEALTH AND FITNESS SYSTEM.



Sports Training– A More Competitive You.

No matter what the sport, we have become a nation conscious of performing to win. We spend hours training, practicing, competing. Bodylink gives you the individual attention of the best pro—anytime you desire for as long as you wish—and at no extra cost. The Bodylink System provides instantaneous feedback on the exact manner in which your muscles are performing, enabling you to correct your swing or refine your pitch while still in motion. Bodylink allows a true two-way conversation between you and your body, giving you the winning edge.

MUSCLE COORDINATION PACKAGE—$149.95
This package includes Bodylink, Standard EMG Sensor and Lead Set, Head-Band, three electrodes and two software cartridges containing several programs.



Reducing Stress. A Healthier and More Productive You.

Medical authorities now consider stress a major health risk which may result in migraines, ulcers, back pain and heart attacks. With Bodylink you have within reach a powerful stress reduction system. Bodylink allows you to focus on physical signs of stress such as muscle tension and skin temperature. By using this feedback, Bodylink quickly and effectively teaches you to reduce stress for a healthier and happier life.

STRESS REDUCTION PACKAGE—$239.95
This package includes Bodylink, Biofeedback EMG Sensor and Lead Set, Head-Band, three Electrodes, Biofeedback Temperature Sensor, and two software cartridges containing several programs.

Getting in Shape...Easier... Safer...More Effectively

Home exercise now becomes exciting and more effective. With Bodylink you can be sure you are exercising for maximum benefit. While using the cardio exercise package, Bodylink monitors your heart rate and helps you determine the ideal level you need for aerobic gain. With the muscle development package, Bodylink guides you to do muscle developing exercises correctly and effectively. Bodylink motivates you to work harder if you are not reaching your target level, or helps you slow down if you are working too hard.

CARDIO EXERCISE PACKAGE—$209.95
This package includes Bodylink, Standard EMG Sensor and Lead Set, Leg-Band, Pulse Rate Sensor, and two software cartridge's containing several programs.

MUSCLE DEVELOPMENT PACKAGE—$169.95
This package includes Bodylink, COMET, and two software cartridges containing several programs.

BODYLINK is a peripheral that plugs into the cartridge slot of the Commodore 64/128 computer. *Knowledge of computers or computer programming is NOT necessary to use BODYLINK.* You don't even need a disk drive to save your data. Various sensors are used to record internal signals from your body and relay them to BODYLINK. You simply place the sensor against the part of your body to be monitored and watch the result on your TV screen.

Commodore is a registered trademark of Commodore Electronics Limited.

DEALERS, PROGRAMMERS AND USER GROUPS INQUIRIES WELCOME

LOOK BETTER!
FEEL BETTER!
COMPETE BETTER!
With the BODYLINK "COMET"™ (COmputerized Muscle Exerciser and Trainer) attachment, you can build and tone the muscle groups of your stomach, chest, back, legs, and arms. COMET is an electronic muscle builder that is connected to BODY-LINK and sends a message to your TV screen when it's compressed or pulled.

AIL ORDER TO: **BODYLOG, INC.**
34 MAPLE AVENUE
ARMONK, N.Y. 10504

ESCRIPTION	UNIT	QUAN	PRICE
luscle Coordination Package	**$149.95**		
luscle Development Package	**$169.95**		
ardio Exercise Package	**$209.95**		
tress Reduction Package	**$239.95**		

ATISFACTION GUARANTEED!
you are not completely satisfied, ou may return the products within 5 days for a full refund.

ayment must accompany rder.

Total Merchandise	
N.Y. Residents please add applicable sales tax.	
Subtotal	
Shipping (Below $200 Add 5% of Subtotal (Over $200 Add 2.5% of Subtotal) OVERSEAS OR APO ADD 5% EXTRA	
TOTAL AMOUNT DUE	

To purchase additional sensors and software separately.

Call for More Information and our product catalogue

914-273-6480 or 1-800-233-2911.

Make checks payable to Bodylog, Inc.
Charge to my ( ) VISA ( ) DISCOVER or ( ) MASTERCARD

Name _____

Address _____

City _____ State _____ Zip _____

Signature _____

Expires _____

All prices and specifications are subject to change without notice. Not responsible for typographic errors.

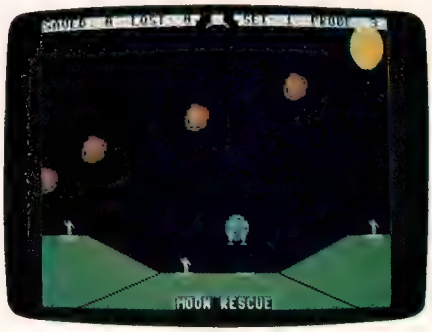
CG11-1-86

Edward E. Boughton

Your mission in this colorful, arcade-style game is to rescue a stranded space colony of scientists. For the Commodore 128. A joystick is required.

You awaken to an alert siren. When you open your eyes, you're disoriented. Your watch says it's 3:51 a.m. "What's going on?" you mutter. Then the announcement blares through the barracks and you remember who you are—a member of the Space Rescue Team. "Attention! Emergency Code Two." You leap from your bed and dress—"neat and fast"—the same way you were trained to do everything. You know you'll be expected in the briefing room in one and a half minutes.

You pilot a remote-control spaceship, a Small Robot Lander, but you call your ship what all the other pilots call it—the SRL. As the pilot of a robot ship, you have an awesome responsibility—although you can never die, your passengers can. Today's emergency mission is to rescue a colony of scientists that's working on a moon under bombardment by an asteroid belt. "Those men should have been evacuated," you growl. "They would have been," says your project leader, "but they said they were onto something really big. You know how hard it is to argue with the scientists."



Your mission in this game is to guide your Robot Lander through the dangerous asteroid belt and rescue a team of scientists. Note that the player has just picked up one scientist and is taking him back to safety.

You begin with three SRLs, and will be assigned an extra one each time you rescue four scientists.

The Mission

Type in and save a copy of "Moon Rescue." To play, load it and type RUN. You're first asked if you wish to "Make New Rocks (Y/N)." Press Y. This sets up the screen and sprite data. This has to be done only at the beginning of a playing session. After your first game, answer N to skip this initialization.

The game begins with your first SRL docked at the top of the screen. There are four belts of asteroids between you and the scientists. Pull the joystick toward you to begin your descent. Your ship is highly maneuverable. You can move in eight directions through joystick control. When you near a scientist, carefully land your ship on the white docking pad. After a few seconds, the grateful—if somewhat distracted—scientist will climb on board. An SRL can hold only one passenger, so you must return to the docking port at the top of the screen before picking up another scientist.

At the top of the screen is a status line which keeps track of the number of scientists saved, the number lost, the number of sets (four per set) of scientists saved, and the number of SRLs left. But as a dedicated rescue team member, you know that there's no real score when it comes to saving lives—only the satisfaction of a job done right.

See program listing on page 129.

ONLY A FANTASY GAMER COULD CALL THIS HEAVEN.

If exploring eerie dungeons filled with monsters is your idea of fun, we've got two fantasy games that'll have you floating on cloud nine. Each breaks new ground in role-playing games with special features:

WIZARD'S CROWN™ lets you resolve combat two ways: The computer can do it quickly, or you can personally direct it with a multitude of tactical options.

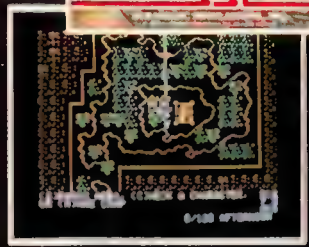
RINGS OF ZILFIN™ adds unprecedented realism to fantasy gaming with its superb graphics. The fully animated scrolling screen grants you step-by-step control of the action.

The gates of heaven are your local computer software or game store. Enter them today.

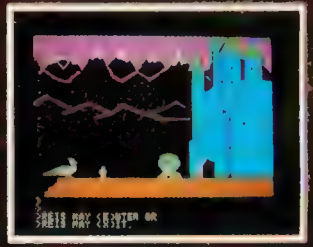
If there are no convenient stores near you, VISA & M/C holders can order these $39.95 games by calling **toll-free 800-443-0100, x335.** To order by mail, send your check to: **STRATEGIC SIMULATIONS, INC.,** 883 Stierlin Road, Building A-200, Mountain View, CA 94043. (California residents, add 7% sales tax.) Please specify computer format and add $2.00 for shipping and handling.

All our games carry a "14-day satisfaction or your money back" guarantee.

WRITE FOR A FREE COLOR CATALOG OF ALL OUR GAMES TODAY.



ON DISK FOR 48K APPLE® II SERIES AND C-64™.



APPLE and COMMODORE 64 are trademarks of Apple Computer, Inc. and Commodore Electronics, Ltd., respectively.
RINGS OF ZILFIN includes graphics routines from Penguin Software's Graphics Magician.®

© 1985 by Strategic Simulations, Inc. All rights reserved.

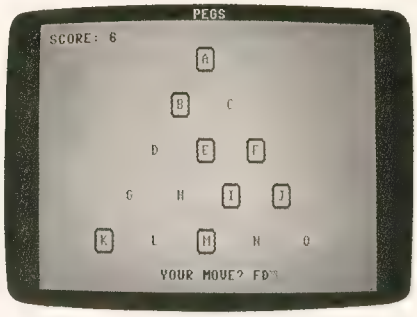
Pegs

Jim and Deborah Chambers

This familiar puzzle takes on a new twist when you play it on your computer. Versions for the Commodore 64, Plus/4 or 16, and VIC (with 8K or 16K RAM expansion).

"Pegs" is a game that has been around for decades. High school shop students and Junior Achievement clubs have produced millions of the little wooden triangles with golf tees for pegs. We've written a computer version of the game which has two advantages over the traditional version. First, you can't misplace any of the pegs, and second, we've added a "take-back" function that allows you to go back as many moves as you like at any time.

The object of Pegs is to leave only 1 of the 14 pegs on the board after a series of jumps. If you leave more than one peg stranded, your score will be lower than the perfect score of 13. Play the game by jumping one peg over another to an empty hole. The peg that was jumped is removed. Repeat this until you can't make any more jumps. The computer will know when you've reached this point and display a final score. It will then ask if you'd like to play again or back up. Type N to return to BASIC, Y to play again, or the back-arrow key (←) to go back one move at a time. Press RETURN after each of these selections.



This traditional game offers a few new twists. In this round, the player has chosen the move FD, which will move the peg at F to D, causing E to be removed from the board.

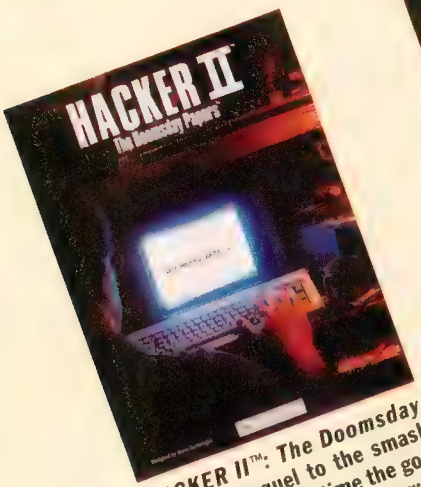
After typing in the version for your computer (Program 1 for the 64, Program 2 for the VIC-20, or Program 3 for the Plus/4 or 16), save a copy to tape or disk. Note that the VIC-20 version requires an 8K or 16K RAM expander. To play, just load the program and type RUN.

Make your move by typing in a two-letter command representing the position you're moving from and the position you're moving to. For example, type DA or FA (the only possible opening moves, incidentally). Press RETURN after you've typed your move. If you find yourself in a hopeless situation, press ← (the back-arrow key in the upper left corner of the keyboard) as many times as necessary to step back through your previous moves.

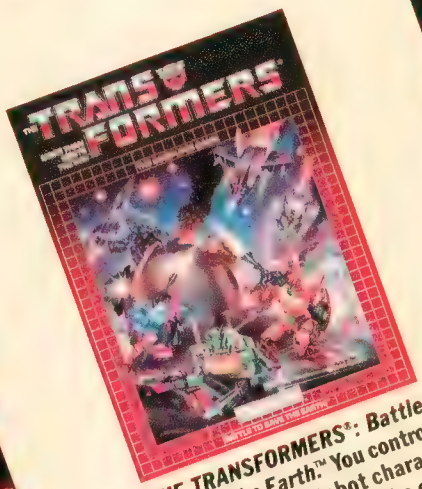
There are several solutions to the puzzle. If you don't succeed the first time or two, try again.

See program listings on page 130.

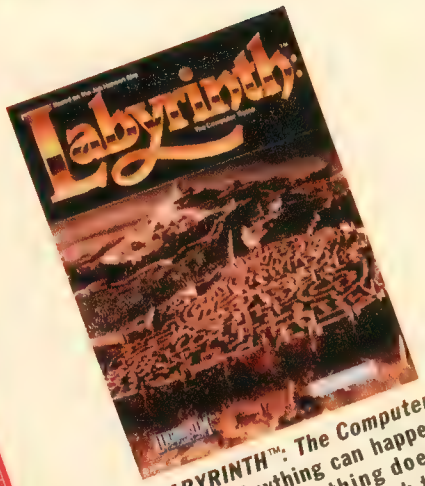
SIX GREAT NAMES IN COMPUTER GAMES



HACKER II™: The Doomsday Papers.™ Sequel to the smash hit, Hacker.™ This time the government needs a little favor; as a computer wizard you must hack your way through Siberian hazards in a maximum security complex.



THE TRANSFORMERS®: Battle To Save The Earth.™ You control your favorite Autobot characters in a battle against the evil energy-stealing Decepticons in this non-stop action adventure of strategy, imagination and skill.

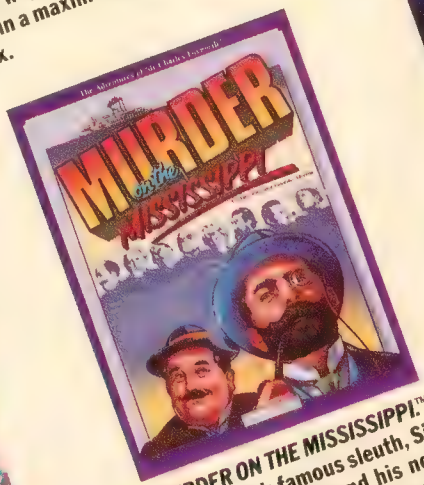


LABYRINTH™: The Computer Game.™ Anything can happen here and everything does! Puzzle your way through this maze of graphic madness, from the Wall of Hands to the Wise Man's Garden. Based on the movie but... expect the unexpected.

HOWARD THE DUCK™®: Adventure on Volcano Island.™ From comic book to cinema to software! Volcano Island is no resort, but then Howard is no ordinary duck. Only quack-fu, quick wits, and you can keep Howard from becoming one plucked duck.

Ask your retailer about our HOT HOLIDAY OFFERS worth $245.

TASS TIMES IN TONETOWN.™ A fast paced, outrageous adventure into an alternate reality where the top tune is Tass by the Daglets, the hot spot is Fast Freddies and everyone is too tass for words.



MURDER ON THE MISSISSIPPI.™ Join Britain's famous sleuth, Sir Charles Foxworth and his not-so-faithful manservant Regis, in this dangerously entertaining 'whodunit' on board the Delta Queen. Solve the mystery and you may win your own River-boat trip.

For most leading computer systems. Available this fall from . . .

ACTIVISION
ENTERTAINMENT SOFTWARE®

Activision is the registered trademark of Activision, Inc. © 1986 Activision, Inc. The Transformers and associated characters are trademarks of Hasbro, Inc. © Hasbro, Inc. All rights reserved.

™® & © 1986 Marvel Comics Group, a division of Cadence Industries Corporation. Licensed by Merchandising Corporation of America, Inc. *Labyrinth* is a trademark of Henson Associates, Inc. used by Activision under authorization. © 1986 Henson Associates, Inc. & Activision, Inc. All rights reserved.

LYCO COMPUTER

Marketing & Consultants, Inc.

WE MAKE YOUR COMPUTER FUN TO USE!"

commodore

COMMODORE

157	CALL
C-64	CALL
1541	CALL
128	CALL
C1902-A	CALL
C 1350 Mouse	39
C 1700 128 K RAM	119
C 1750 512 K RAM	169
Jane	35
GEOS	CALL
Perfect Writer	45.95
Perfect Calc	45.95
Perfect Filer	45.95

EPYX-64

Movie Monster	24.75
Vorpol Kit	22.75
Fast Load	24.75
Summer Game II	24.75
Super cycle	24.75
World games	24.75
Football	24.75

HI TECH

Cardware	8.95
Partyware	8.95
Heartware	8.95
War With All	12.95
Holiday Paper	8.95

FIREBIRD (C-64)

Elite	22.75
Tracker	28.75
The Pawn	CALL

XETEC

Font Master II 64	32.95

ACTIVISION

Alter ego	28.75
Hacker	18.75
Little People	20.75
Game Maker	24.75
Borrowed Time	18.75
Space shuttle	18.75
Music studio	22.75
Mind shadow	18.75
Road Race	18.75
Fast Tracks	22.75
Count down	18.75
Basketball	18.75

SUB LOGIC

Flight Simulator	29.95
Jet Simulator	29.95
Football	25.95
Scenery Disk ... EA	14.95
Set 1-6	69.95

BRODERBUND

Printshop	28.75
Graphic Lib. I, II, III	18.75
Karateka	19.75
Printshop Comp	24.75
Printshop Paper	12.95

MICROLEAGUE

ML Baseball	24.95
General Manager	24.95
85 team disk	14.95
Franchise	19.95
Stat Disk	16.95

TIMEWORKS (C-64)

Data Manager-128	42.95
Swiftcalc-128	42.95
Wordwriter-128	42.95
A/Payable-128	38.95
A/receivable-128	38.95
General Ledger-128	38.95
Inventory-128	38.95
Payroll-128	38.95

TOLL FREE 1—800—233—8760

UNISON WORLD

Printmaster(Amiga)	22.75
Printmaster (C-64/128)	22.75
Art Gallery	16.75

BATTERIES INCLUDED

Consultant	32.95
Paperclip w/spell pk	48.95

SPRINGBOARD (C-64)

Newsroom	32.75
Clip Art 1	18.75
Clip Art 2	24.75

ACCESS (C-64, Amiga)

Leader board	24.75
Leader board Amiga	24.75

ACTIVISION (Amiga)

Hacker	26.75
Mind shadow	26.75
Music studio	34.75
Borrowed Time	26.75

JOYSTICKS FROM WICO & SUNCOM

Bat Handle	16.75
Boss	11.99
Super 3-way	19.99
TAC 3	9.95
Slik stik	6.95
Economy	5.95

DUST COVERS

Atari

520ST	11.95
130XE	6.99
800XL	6.99
1050	6.99
1025	7.99

Commodore

C128	7.99
1571/1541	6.99
1902	10.95
1702	8.99
C64/Vic20	6.99

Panasonic

1090/1091	8.99
1092	8.99
1093	9.99

INNOVATIVE CONCEPTS

Flip-N-File 10	2.49
Flip-N-File 25 Lock	10.95
Flip-N-File 50 Mini	10.95
Flip-N-File 50 Lock	15.95
Flip-N-File ROM	7.99

DISK DRIVE CLEANING KIT
$8.95

With Software
$17.95

NAME BRAND VIDEO TAPES
from
$4.49
Qty. Discounts Available

NEW HOURS
Mon-Thur—9 AM-8 PM
Fri—9 AM-6 PM
Sat—10 AM-6 PM

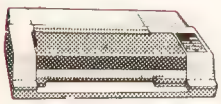
Buy Lyco and Enjoy

★ THE LOWEST PRICES ★ TOLL FREE ORDER LINE ★

★ Free shipping on prepaid cash orders in U.S. ★ All Merchandise Factory Fresh ★ Fast Service from one of the oldest and most established Computer Supplier ★ 24 hrs. shipping on in-stock product ★ Access to our Multi Million $ inventory ★ No deposit on UPS C.O.D. orders ★ Orders outside PA Save state sales tax ★ Air freight service available ★ Full Manufacturer's Warranty apply! ★ Full accessory line in stock ★ Purchase orders Accepted from educational institutions! ★ We check for stolen credit cards! ★ We ship to our servicemen overseas! ★ You'll love our Courteous Sales Staff! ★ We satisfy more customers monthly than most of our competitors combined ★

LYCO COMPUTER

Marketing & Consultants Inc.



PANASONIC

1091	225
1092	309
1592	419
3131	249
3151	399

DIABLO

D25	549
P-32 CQ1	699
635	1029
D-801F	2395

BROTHER

HR-15XL-P	339
1509	409

SEIKOSHA

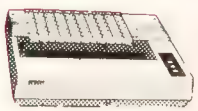
SP-1000 VC (C-64)	165
SP-1000 A Centronics	185
SP-1000 IBM	185
SP-1000 As Rs-232	185
SP-1000 AP, APIIc	185
BP-1300	469
BP-5200	649
BP-5420	999
Color Kit	119
BP-5420 ribbon	12.50
SP-1000 ribbon	8.50

JUKI

Juki 6100	CALL
RS-232 Serial board	55
6100 tractor	119
6100 sheet feeder	209
5510 Juki	CALL
Juki 6300	CALL

LEGEND

808	148
1080	199
1380	229
1385	289



OKIDATA

Okimate 20	199
120 NLQ	205
182	214
192+	348
292	499
293	599
93	CALL
193+	CALL

SAVE ON THESE IN STOCK PRINTERS

SILVER REED

EXP 420P	209
EXP 600P	489
EXP 800P	649
EXP 770	740

TOSHIBA

321P/S	489
P341P	829
P3410P/S	859
P351	999
351 sheet feeder	529

CITIZEN

120-D	179
MSP-10	285
MSP-15	385
MSP-20	325
MSP-25	485
Premier 35	469

EPSON

LX86	CALL
FX-85	CALL
DX10	CALL
DX35	CALL
H180	CALL
HS80	CALL
FX286	CALL
LQ800	CALL
LQ1000	CALL
EX800	CALL

C. ITOH

1550 SP+	CALL
D 1040	CALL
Prowriter Jr	CALL
Prowriter 8510 SP+	CALL

STAR MICRONICS

LV 12-10 (IBM)	CALL
NL-10	CALL
NX-10	CALL
NB-15	CALL
SB-15	CALL
SG-15	367
SD-10	319
SD-15	438
SR-10	469
SR-15	578
SB-10	589

MONITORS

PANASONIC

TR-122 MYP 12" Amber TTL	139
TR-122 M9P 12" Green TTL	139
TX-12H3P 12" RGB	369
DT-H103 10" RGB	349

HITACHI

MM-1218 12" Green	99
MM-1220 12" TTL Amber	129
CM-1406C 13" color w/ cable	179
CM-1409 13" RGB	305
CM-1216D 12" RGB	385
CM-1455S 13" 720x350	525
CM-1457A 13" RGB 720x460	679

THOMPSON

365 12 RGB	CALL

TEKNIKA

MJ-22	249
MS-305 RGB	309

ZENITH

ZVM 1220	89
ZVM 1230	89
ZVM 1240	149

COMMODORE

1902 Color	CALL
1802	CALL

PRINCETON GRAPHICS

MAX-12 Amber	175
HX-12 RGB	458
SR-12 RGB	575

INTERFACING

TYMAC

Connection (C-64)	49

XETEC

Super Graphix 64	64
Super Graphix SR 64	45

ORANGE MICRO

Grappler CD (C-64)	79

PPI

C-64	49

DISKETTES

5¼" DISKETTES

MAXELL

SSDD	9.99
DSDD	12.99

BONUS

SSDD	6.99
DSDD	7.50

SKC

SSDD	8.50
DSDD	9.50
DSHD 96 TPI	19.50

3.5 DISKETTES

3M

SSDD	16.99
DSDD	23.99

MAXELL

SSDD	16.99
DSDD	23.99

VERBATIM

SSDD	16.99
DSDD	24.99

DRIVES

COMTEL

Enhancer 2000 (C-64)	149

INDUS

GT Commodore	179

COMMODORE

1571, 1541	CALL

MODEMS

SUPRA

1064 Modem (C-64)	49.95
Supra 300	39.95
Supra 1200	149.95

COMPUSERVE . . 18.95

COMMODORE

1670	155

DSI

Messenger 64/128	39.95

TOLL FREE 1-800-233-8760

IN PA **717-494-1030**

CUSTOMER SERVICE 717-494-1670

or send to
Lyco Computer
P.O. Box 5088
Jersey Shore, PA
17740

MASTERCARD

VISA

Risk Free Policy

In stock items shipped within 24 hrs of order. No deposit on C.O.D. orders. Free shipping on prepaid cash orders within the continental U.S. Volume discounts available. PA residents add sales tax. APO, FPO and international orders add $5.00 plus 3% for priority mail. Advertised prices show 4% discount for cash, add 4% for Master Card and VISA. Personal checks require 4 weeks clearance before shipping. We cannot guarantee compatibility. We only ship factory fresh merchandise. Ask about UPS Blue and red label shipping. All merchandise carried under manufacturer's warranty. Return restriction applicable. Return authorization required. All items subject to change without notice.

The Animals' Show

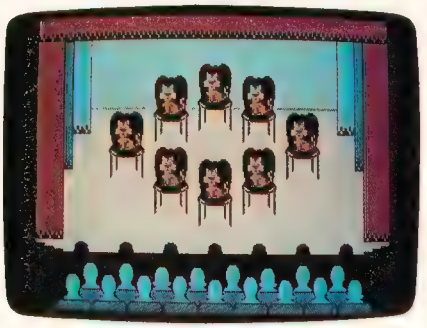
Cullen O'Day

This is one of the most enchanting and fun programs we've seen. Both children and adults will enjoy creating and saving songs performed by various octets of musical animals. For the Commodore 128. A disk drive is required.

It's the night of the animals' show. The audience has been seated; the house lights are down; the players have warmed up—it's showtime!

"The Animals' Show" is a creative and playful music game geared to children at two age levels. Younger children can use a joystick to play intuitively. Older children (and adults) will prefer to compose with the 128's numeric keypad. In either case, kids can play for as long as they like. When they finish, they have their own original songs to show off to parents and friends.

The main menu lets you select a performance from any of five kinds of animals—as well as other disk and program functions. The cat is being selected as the performer of the next song.



Eight cats perform your song as a captivated audience looks on. You can store your song on disk for a future performance.

Strike Up The Band

After typing in the program, be sure to save a copy. (Pay particular attention to typing in lines 130–170.) To get started, load the program and type RUN. You'll be prompted to select either the joystick (in port 2) or the numeric keypad as an input device. The title screen is displayed while the program reads the sprite and character data.

Next, the menu screen is displayed. Arranged in a circle are eight available options: the five different types of animals, disk functions, replay function, and quit option. If you're running the program for the first time, select one of the animals. Whenever you choose an animal from the main menu, you'll write a new song. If you're using a joystick, simply push it in the direction of your selection. If you're using the keypad, the positions of the keys within the keypad arrangement correspond to the positions of the menu selections: 1 = disk functions, 2 = quit, 3 = replay, 4 = frogs, 6 = parrots, 7 = pigs, 8 = cats, and 9 = mice (the 5 key serves no function). Each animal has a unique pitch and vocal range. To register your selection, press the joystick fire button or the ENTER key.

The menu screen is then replaced by the stage and audience. Press the fire button or the ENTER key to open the curtain. After the applause has died down, move the joystick or push the keypad keys for the animals' performance. The lowest note is made by pressing forward on the joystick or by pressing 8 on the keypad. Notes get higher as you progress clockwise. Thus, to play an ascending scale, type 8 9 1 2 3 4 5 6 7. Keypad users can use the 0 key to insert rests into the song—there is no joystick equivalent for rests.

When your composition is completed, press the fire button or the ENTER key. The audience will applaud your composition and the animals' performance. After the curtain closes, the program will return to the menu.

Now choose the replay option and press the fire button or the ENTER key. An animal menu will appear. Select an animal; then press the fire button or the ENTER key. Sit back and watch as the stage appears and the curtain opens automatically. Eight animals of the kind you selected will sing your most recently created song. The audience will applaud and the curtain will close.

Saving Your Song

Select the disk option when the menu appears. The program asks if you want to save or load a song. Press S. At the next prompt, type in a title for your song and press RETURN. The disk drive will spin for a few seconds and the menu screen will return.

Whenever you want to hear your song, select the disk option and press L at the Save or Load prompt. Then type the song's name, press RETURN, and the song will be loaded. The animal menu will then appear just as it does in the replay option. Make your choice and listen once again to your masterpiece.

If you find that the program won't let you write long enough songs (it currently allows 200 notes, including rests), raise the value of the variable SE in line 190.

See program listing on page 134.

GAMES THAT KEEP THE WORLD AWAKE.

Imagine a game so exciting, so challenging, so innovative that you want to stay up all night to play it *just one more time.* The rest of the world has been enjoying software like this for years. Now it's your turn.

Announcing an extraordinary line of entertainment software that has finally reached American shores–**Electric Dreams.**

Proven bestsellers from around the world. Guaranteed to open your eyes.

Electric Dreams. Dedicated to finding the best in entertainment software from around the world and bringing it to America.

Over 100,000 sold in Europe

The Rocky Horror Show
Based on the cult classic. "One of the best games ever... sure to become a bestseller... a classic."–Commodore Computing (United Kingdom)

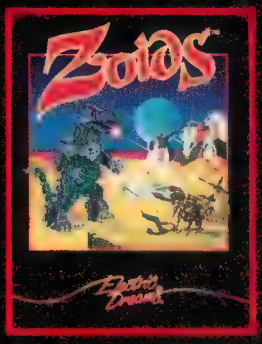
For the Commodore 64 and 128, and Apple II computer systems.

#1 on UK Charts

Spindizzy
A 3-D arcade/strategy adventure. "Stunningly original...fiendishly compulsive and graphically superb..."–Amstrad Action (United Kingdom)

For the Commodore 64 and 128, and Apple II computer systems.

Multiple award winner



Zoids
War machines in deadly battle. "...sophisticated, absorbing and addictive..." –Computer and Video Games (United Kingdom)

For the Commodore 64 and 128, and coming soon for Apple II computer systems.

Electric Dreams

Stay up all night with Electric Dreams

Distributed and marketed exclusively by Activision. © 1986 Activision, Inc. Electric Dreams is a registered trademark of Activision Inc. Covered by limited warranty. Details enclosed. Activision, Inc., P.O. Box 7287 Mountain View, CA 94039

User Group Update

When writing to a user group for information, please remember to enclose a self-addressed envelope with postage that is appropriate for the country to which you're writing.

Send typed additions, corrections, and deletions for this list to:

COMPUTE! Publications
P.O. Box 5406
Greensboro, NC 27403
Attn: Commodore User Groups

User Group Notes

You can reach the **LIVICS Commodore Users Group** at 15 Hastings Dr., Stony Brook, NY 11790.

Mohawk Valley Computer Users Group has changed its address to R.D. #2, Box 177, Johnstown, NY 12095.

Lowerbucks Users Group has a new address: P.O. Box 548, Feasterville, PA 19047

The new address for the **Central Dakota Commodore Club** is 12 Captain Leech Dr., Mandan, ND 58554

New Listings

ALABAMA

The Commodore Connection, P.O. Box 1003, Birmingham, AL 35126

ARKANSAS

Jintres Hillbilly's C64 User Group, 721 Drennen St., Van Buren, AR 72956

CALIFORNIA

Commodore Owners Users Group of Redding (COUGOR), 2776-A Helen St., Redding, CA 96002

DELAWARE

Dover Commodore User's Club, P.O. Box 1313, Dover, DE 19901

GEORGIA

Metro BBS Society, 1842 Cashmere Ct., Lithonia, GA 30058

INDIANA

Johnson County Commodore User's Group (JCCUG), 419 W. Jefferson St., Franklin, IN 46131

KANSAS

Commodore User's Group of McPherson (CUGOM), 1009 Sycamore Pl., McPherson, KS 67468

MASSACHUSETTS

Opportunities Adventure Game Club, 12 Spring Ave., Wakefield, MA 01880

NEW YORK

Mi-Comm User Group, Box 64, Plainview, NY 11803

Tri City Commodore User's Group (TCCUG), P.O. Box 12742, Albany, NY 12212-2742

Waterfalls VIC?/64 Users Group, 47 N. Walnut St., Waterloo, NY 13165

Leatherstocking Commodore User's Club, P.O. Box 1284, Oneonta, NY 13820

TEXAS

128 Users of Dallas/Ft. Worth, P.O. Box 530861, Grand Prairie, TX 75053-0861

Commodore Languages and Operations Group (C/LOG), Rt. 1, Box 158, Groesbeck, TX 76642

General User's Group (GUG), P.O. Box 531, Borger, TX 79008-0531

Outside The U.S.

AUSTRALIA

SYDCOM, The Commodore Users Group, Box 1542, G.P.O. Sydney 2001, Australia

CANADA

Commodore Users Club of Sudbury, 23 Claudia Ct., Sudbury, Ont., Canada P3A 4C1

C-64 Users Group of Canada, Snowdon, P.O. Box 1205, Montreal, Quebec, Canada H3X 3Y3

MEXICO

Golden Chips Users Group, Ibsen 67 #2, Mexico D.F., Mexico 11560

SWEDEN

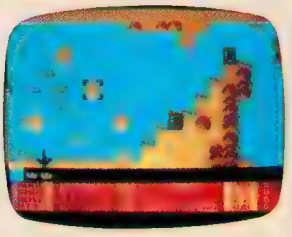
Commodore-Klubben, Lars Persson, Box 18158, 200 32 Malmo, Sweden

Soviets invade Iran!
Gulf war expands!

It is April, 1988 and the Ayatollah has been deposed. Iran is once again a major US ally, openly supporting the struggling Afghan guerillas. In response, the Soviet Union and Iraq have sent their T-72 tanks rolling over the Iranian borders . . . intent on making Iran theirs! Can you halt the invasion? Can anyone? Find out for yourself.

$30

Gulf Strike has drawn unanimous raves from major software magazines as well as the gaming public. *Family Computing Magazine* has called **Gulf Strike** a "major leap forward for the genre, and the best computer wargame to date." Available on diskette for the Atari home computer, Apple II, Commodore 64/128, IBM PC and PCjr (100% compatibles with Color Graphics Board).



Available at leading Computer, Software and Game stores, or direct from:

microcomputer games DIVISION

The Avalon Hill Game Company

A MONARCH AVALON, INC. COMPANY
4517 Harford Road • Baltimore, MD 21214
301-254-9200 • 301-254-5300 • 1-800-638-9292
Ask for Operator G

Send $1 for a Complete Game Catalog

Have your Commodore® look as smart as it works.

Consolidate your 64, 64C and 128 system with the Command Center.

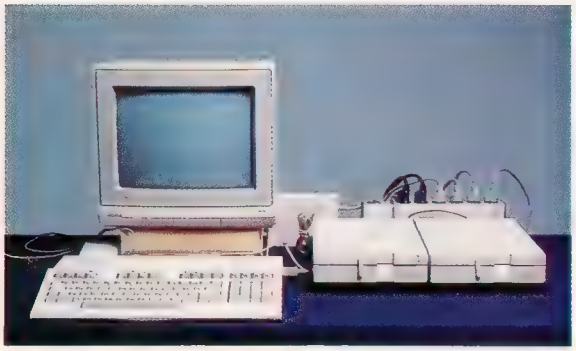
With the Command Center, your system is compact and complete.

Get your workspace back again.

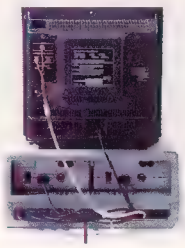
The Command Center will untangle your wires, unclutter your desk and put peripherals at your fingertips. Condensing your whole system into one compact unit, you might consider it the **ultimate** Commodore peripheral. You get Commodore value with the look of a more expensive system.

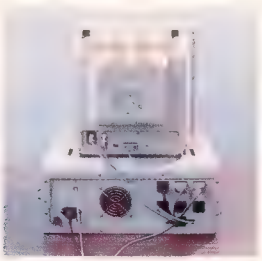
Just look at all it includes:

- **Built-in AC Power Strip** with power surge and voltage spike protection, line noise filtering and power outlets.
- **Built-in Drive/CPU Cooling Fan** to prevent overheating.
- **Modular Telephone Plug**, with its own on-line/off-line telecommunications switch. (Option on 64 and 64C).
- **Master AC Switch** for easy system power-up.
- **Single or Dual Drive Configurations** with the standard drive insert.



Without the Command Center your Commodore peripherals look cluttered and take up most of your desk top.





Many built-in conveniences add to the Command Center's value.

®Commodore is a registered trademark of Commodore Electronics Ltd

KETEK

Free 30-day trial offer
and one-year warranty.

For faster service, call
1-800-626-4582 toll-free
1-319-338-7123 (Iowa Residents)

KETEK P.O. Box 203
Oakdale, IA 52319

YES! Rush me a Command Center to complete my system. I may enjoy it for up to 30 days and return it for a full refund.

- ☐ 64 ..... $119.95
- ☐ 64C $129.95
- ☐ 128 ..... $149.95

(Please include $3.50 for shipping and handling.)

Name _____

Address _____

City _____ State _____ Zip _____

Phone Number _____

DEALER INQUIRIES INVITED

Larry Cotton

Before we get back to experimenting with the PRINT statement, let's take a brief look at the NEW command. When you type NEW and press RETURN, you're telling the computer, "Erase this program and reset your memory for another one." Without this command, you'd have to turn off the computer to start working on a new program.

NEW should be typed only when you're *sure* you want to erase the program in memory. If you're not sure, but you still want to start a new program, just save the old one to tape or disk.

I also promised last month that we'd clear up a few aspects of the PRINT statement which were left hanging. The first concerns the way things are arranged on the screen. This depends on how PRINT statements are punctuated.

Punctuating PRINT

There are four ways to punctuate the end of a PRINT statement—with a comma, semicolon, a colon, or with no punctuation at all. First let's start with no punctuation. Type this:

```
10 PRINT"ABCDEFGHI"
20 PRINT"ABCDEFGHI"
30 PRINT"ABCDEFGHI"
40 PRINT"ABCDEFGHI"
```

There are nine letters in each string. Run this program and observe the results. Next, add a comma right after the second quotation mark in all lines.

When you run it now, the letters are arranged on the screen in columns. The comma at the end of each line tells the computer to arrange whatever is in quotes into four columns of 10 characters each (except for the VIC-20, which will arrange the text into 11-character columns).

The computer insists on putting at least one space between columns. Thus, if there were ten characters inside the quotes (go ahead—try it), the computer would push the information over into the next column. Also try changing the information in the quotes to seven or eight characters.

Changing the comma to a semicolon yields entirely different results. The messages are printed continuously without spaces.

Let's assign some string variables and print them. Type NEW, then this:

```
10 A$="STRING"
20 B$="VARIABLE"
30 PRINT A$,B$
40 PRINT A$;B$
50 PRINT A$B$
```

When you run this, line 30 breaks the strings into columns, while lines 40 and 50 print them together. In the case of string variables, a semicolon is not required between the variable names to print them continuously.

Now type NEW and this:

```
10 A=1234567
20 B=7654321
30 PRINT A,B
40 PRINT A;B
50 PRINT AB
```

A and B are numeric, not string, variables. They can have a maximum of seven numerals each (eight for the VIC-20) in order to be printed in adjacent columns because Commodore BASIC puts a space (or a negative sign if the number is less than zero) before and a space (for separation) after each printed numeric variable, in addition to the space between columns. Line 30 demonstrates this. Try changing A and B to numbers with four or five numerals.

Even with a semicolon (line 40), two spaces are added between the values for A and B. In line 50, we attempt to print A and B without any punctuation, but the computer interprets AB as another variable entirely. Since its value hasn't been assigned, the computer prints the number 0.

Numeric and string variables can be either one letter, two or more letters, or a combination of a letter and number. Examples of valid variables are D, D$, D4, D4$, DE, DE$, DEVO, and DEVO$.

The number can't come first in a variable—4D and 4D$ don't work. And if you use more than two characters, the computer sees only the first two. Thus DE, DEVO, and DEVICE are all the same to the computer.

On To INPUT

We'll continue to use PRINT in our short BASIC programs, but for now, let's concentrate on a BASIC statement which can be even more fun to use—INPUT.

INPUT is fun to use because it requires the intervention of a human in order to work. Type NEW and then enter this program:

```
10 PRINT"{CLR}"
20 INPUT A$
30 PRINT A$
```

Now run it. Line 10 clears the screen and sends the cursor home. Line 20 causes the computer to wait for the user to type something, as indicated by the incessantly blinking cursor. It's waiting for the user to type something that the computer will define as a string—A$.

The string can consist of almost anything that's printable—letters, symbols, most punctuation, even numbers, although they're treated just like a string of letters; you can't perform any math operations on them.

INPUT also requires one more thing before it moves on, and that's a RETURN. After you press RETURN, line 30 prints the message just like you typed it.

If you include a comma or colon

Famous National Brand

Commodore® • Atari® • Apple® • IBM®

We Like this Printer so much
We Bought Out the Factory.

Sale $39.95 List $199.00

80 Column Printer Sale

Sale $39.95 List $199.00

• Word Processing • Program Listings • Graphics • Quiet Operation • Upper and Lower case • All points addressable Graphics • Underline • Enlarged • Much much More

Complete your set up with a Printer Stand **SALE $14.95** and Complete Printer Care Kit **SALE $19.95**
(Care Kit will add time to your printers life span.)

Super Print Quality

This printer was made by **Canon®** for the IBM PC and PCjr. The Big Blue printer comes ready to hook up to the serial port of the **IBM®** PC jr. Plus with low cost adapter cables you can connect the Big Blue printer to the **Commodore®** 64 ,128, **IBM®** PC, **IBM®** XT, **IBM®** AT, **IBM Compatibles , Apple®** II,IIe,IIc, **Apple Compatibles, Atari®**, plus many more.

• 90 Day Immediate Replacement Warranty **• 15 Day Free Trial-Satisfaction or Money Back**

Now you can have a full fledged 8½'' letter size 80 column printer for less than the cost of a large box of paper. This printer uses advanced dot matrix, heat transfer technology to print upper and lower case (with true lower descenders), underline, enhanced, all points addressable graphics (works with Printshop) plus More. Print out pictures, program listings, wordprocessing pages, graphics and more. Perfect for the homeowner or student and definitely affordable. Fantastic Printer at an unbeatable price. List $199.00 **Sale $39.95**

Paper (2 Rolls) List $19.95 **Sale $5.95**

Intelligent Commodore Interface— Allows you to connect the Big Blue printer to the printer port of the Commodore 64 and 128 computer. Print Commodore graphics, use Printshop, Word processors and more... List $49.95 **Sale $19.95**

Intelligent Atari Interface— Allows you to connect the Big Blue printer to Atari computers (except 1200). Print Atari graphics, Printshop ,word processors, and more... List $49.95 **Sale $19.95**

RS-232 Adapter— Adapts the Big Blue printer to be used with any IBM® PC, AT, XT.PCjr. Apple® II series RS-232 port. List $19.95 **Sale $9.95**

Laser128, Apple IIc interface— List $24.95 **Sale $12.95**

Printer Stand List $24.95 **Sale $14.95** - Complete Printer Care Kit List $29.95 **Sale $19.95**

IBM, Apple, Canon, Commodore, Atari are trademarks of International Business Machines, Apple Computer, Canon Inc, Commodore Business Machines, Atari Inc, Respectively.

Add $7.50 for shipping, handling and insurance. Illinois residents please add 6½% tax. Add $15.00 for CANADA, PUERTO RICO, HAWAII, ALASKA and APO-FPO orders. All orders must be in U.S. dollars. WE DO NOT EXPORT TO OTHER COUNTRIES, EXCEPT CANADA. Enclose Cashier Check, Money Order or Personal Check. Allow 14 days for delivery, 2 to 7 days for phone orders, 1 day express mail! Prices & Availability subject to change without notice.
VISA — MASTER CARD — C.O.D. C.O.D. on phone orders only

PROTECTO

We Love Our Customers

22292 N. Pepper Rd., Barrington, Illinois 60010

312/382-5244 to order

SALE SUPER VALUES SAVE

PROTECTO ENTERPRIZES

SINGLE SIDED/DOUBLE DENSITY DISKS

.29 ea.

100% Certified 5¼" floppy disks. **Lifetime Warranty**, automatic lint cleaning liner included. 1 Box of 100 $29.00 List $1.99 ea. **SALE $.29 ea.**

VOICE SYNTHESIZER

SALE $29.95 List $89

Just plug it in and you can program words and sentences, adjust volume and pitch, make talking adventure games, sound action games and customized talkies! PLUS ($19.95 value) TEXT TO SPEECH program included FREE. (Disk or Tape) List $89.00 **SALE $29.95**

VOICE COMMAND MODULE

SALE $29.95 List $80

The VCM is a speech recognition device that lets you give commands to your C-64 with your voice. List $79.95 **SALE $29.95**

SUPER AUTO DIAL MODEM

SALE $29.95 List $99

Easier to use than dialing your telephone. Features on-line clock, dialing from keyboard, capture and display high resolution characters, and much more. Includes exclusive easy to use program for up and down loading to printer and disk drives. ***Best in U.S.A.*** List $99.00 **SALE $29.95**

1200 BAUD MODEM

SALE $79.95 List $199

Same features as the above modem along with C-128 mode and 1200 Baud speed. List $199.00 **SALE $79.95**

SOFTWARE

ACCESS
- ACTION PACK (D) $19.95
- LEADER BOARD (D) 23.95
- COURSES FOR LEADER BOARD (D) 13.95
- MACH 5 (C) 19.95
- MACH 128 (C) 28.95
- TENTH FRAME (D) 23.95

ACCOLADE
- ACE OF ACES (D) $18.95
- DAM BUSTERS (D) 18.95
- ACCOLADE FOOTBALL (D) 19.95
- FIGHT NIGHT (D) 18.95
- HARDBALL (D) 18.95
- LAW OF THE WEST (D) 18.95
- KILLED UNTIL DEAD (D) 19.95

COSMI
- SUPER HUEY II (D) $14.95
- TALLADEGA (D) 12.95
- BEYOND FORBIDDEN FOREST (D) 14.95

BCI
- PRO GOLF BY TOM WEISKOPF (D) $11.95
- MR. TESTER (D) 5.95
- PRINTERS LIB. 1 (D) 8.95
- PRINTERS LIB. 2 (D) 8.95
- DATABASE MGR./PLUS FOR C128 (D) 14.95
- TASK FORCE (D) 4.95

BRODERBUND
- PRINT SHOP (D) $27.95
- GRAPHICS LIB. 1,2 or 3 (D) 15.95
- COMPANION (D) 22.95
- TOY SHOP (D) 39.95
- WHERE IS CARMEN SAN DIEGO (D) 21.95
- GRAPHICS LIB. HOLIDAY ED. (D) 15.95

DATA EAST
- COMMANDO (D) $22.95
- KARATE CHAMP (D) 22.95
- KUNG FU MASTER (D) 22.95

DATA SOFT
- 221 B BAKER STREET (D) $18.95
- MERCENARY (D) 18.95
- NEVER ENDING STORY (D) 18.95
- MIND PURSUIT (D) 18.95
- VIDEO TITLE SHOP (D) 18.95
- THEATRE EUROPE (D) 19.95

DESIGNWARE
- BODY TRANSPARENT (D) $26.95
- EUROPEAN NATIONS & LOCATIONS (D) 19.95
- STATES AND TRAITS (D) 19.95

ELECTRONIC ARTS
- HEART OF AFRICA (D) $9.95
- ONE ON ONE (D) 9.95
- PINBALL CONTRUCTION (D) 9.95
- MUSIC CONSTRUCTION (D) 9.95
- RACING DESTRUCTION (D) 9.95
- MARBLE MADNESS (D) 24.95
- CHESSMASTER (D) 26.95
- BATTLEFRONT (D) 26.95
- LORDS OF CONQUEST (D) 22.95

BLUE CHIP
- BARON (D) $16.95
- MILLIONAIRE (D) 16.95
- TYCOON (D) 16.95

EPYX
- CHAMPIONSHIP WRESTLING (D) $23.95
- FAST LOAD (C) 22.95
- MOVIE MONSTER (D) 23.95
- WINTER GAMES (D) 23.95
- WORLD GAMES (D) 24.95
- WORLD KARATE (D) 17.95
- WORLD'S GREATEST FOOTBALL (D) 22.95

FIREBIRD
- COLOSSUS CHESS (D) $22.95
- ELITE 64 (D) 19.95
- FRANKIE GOES TO HOLLYWOOD (D) 21.95
- BATTLE OF BRITAIN/BATTLE OF MIDWAY (D) 9.95
- IWO JIMA/FAULKLANDS (D) 9.95
- TALKING TEACHER (D) 24.95

HI—TECH EXPRESSIONS
- CARD WARE (D) $7.95
- HEART WARE (D) 7.95
- PARTY WARE(D) 9.95
- WARE WITH ALL KIT (D) 9.95
- JINGLE DISK (D) 5.95
- HOLIDAY PRINT PAPER (D) 7.95

SUB—LOGIC
- FLIGHT SIMULATOR II (D) $31.95
- JET (D) 26.95
- FOOTBALL (D) 27.95
- BASEBALL (D) 31.95

S.S.I.
- ROADWAR 2000 (D) $23.95
- BATTLE OF ANTIETAM (D) 31.95
- GETTYSBURG (D) 34.95
- MECH BRIGADE (D) 34.95
- NAM (D) 23.95
- U.S.A.A.F. (D) 34.95
- KAMPFGRUPPE (D) 34.95
- WAR SHIP (D) 34.95

HAYDEN
- SARGON II (D) $9.95
- SAT VERBAL (D) 14.95
- SAT MATH (D) 14.95
- SAT PRATICE TEST (D) 14.95

SOFTSYNC
- ACCOUNTANT, INC. C128 (D) $99.95
- DESK MANAGER (D) 24.95
- KID PRO QUO (D) 22.95
- MODEL DIET (D) 18.95
- TRIO C64 (D) 29.95

SPINNAKER — BUY 1 GET 1 FREE
- DELTA DRAWING (C) $9.95
- NUMBER TUMBLERS (C) 9.95
- SEA SPELLER (C) 9.95
- UP & ADD'EM (C) 9.95

BEST SERVICE IN THE U.S.A. • 90 DAY REPLACEMENT WARRANTY • ONE DAY EXPRESS MAIL • 15 DAY FREE TRIAL • OVER 500 PROGRAMS • A CUSTOMER LIST OF OVER 3,000,000 LARGEST IN THE U.S.A.

CALL FOR FREE CATALOG WITH $2.00 OFF COUPON!

SPECIAL BONUS COUPON

We pack a special software discount coupon with every Commodore 64 Computer, Disk Drive, Printer, or Monitor we sell! This coupon allows you to **SAVE OVER $250** off sale prices!

(EXAMPLES) PROFESSIONAL SOFTWARE COMMODORE 64

Name	List	Sale	Coupon
B. I. Homepak	$49.95	$19.95	$17.95
Super Huey II	$19.95	$14.95	$12.95
Flight Control Joystick	$19.95	$12.95	$10.00
Newsroom	$49.95	$32.95	$29.95
Leader Board	$39.95	$23.95	$22.95
TV Tuner	$99.95	$49.95	$39.95
Commando	$34.95	$23.95	$21.95
Create with Garfield	$29.95	$16.95	$14.95
Geos	$59.95	$39.95	$37.95
SAT The Perfect Score	$69.95	$42.95	$39.95
World Games	$39.95	$24.95	$22.95
Millionaire	$29.95	$16.95	$14.95
Trinity	$34.95	$24.95	$22.95
C128 Partner	$69.95	$49.95	$44.95
Robotics Workshop	$149.95	$124.95	$114.95
C128 Programmers Reference Guide	$21.95	$12.95	$ 9.95

(See over 100 coupon items in our catalog.)

Write or Call for sample Special Software Coupon!

PHONE ORDERS

8 a.m. - 8 p.m. C.S.T. Weekdays
9 a.m. - 12 noon C.S.T. Saturdays

(312) 382-5244

Add $3.00 for shipping, handling, and insurance. Illinois residents please add 6½% sales tax. Add $6.00 for CANADA, PUERTO RICO, HAWAII, ALASKA, APO-FPO orders. All orders must be in U.S. Dollars. WE DO NOT EXPORT TO OTHER COUNTRIES EXCEPT CANADA. Enclose Cashier Check, Money Order or Personal Check. Allow 14 days for delivery, 2 to 7 days for phone orders, 1 day express mail. Prices & Availability subject to change without notice. Hardware shipping prices vary according to weight. Please call for amount. No APO-FPO for Monitors.

VISA—MASTER CARD—C.O.D. C.O.D. on phone orders only.

THE PROTECTO WARRANTY

All Protecto's products carry a minimum 90 day warranty. If anything fails within 90 days from the date of purchase, simply send your product to us via United Parcel Service prepaid. We will IMMEDIATELY send you a replacement at no charge via United Parcel Service prepaid. This warranty proves that ***We Love Our Customers.***

SAVE SUPER DEALS SALE

(312) 382-5244 TO ORDER

COMMODORE 64 COMPUTER

SALE $98.00* List $299

You pay only $99.00 for the Commodore 64 when you purchase a **Pocket Writer 64** word processor for only $39.95. List $299.00 **SALE $98.00**

1541 DISK DRIVE

SALE $179.95 List $249

To run all that software and add to the prestige of your system, you'll want the 1541 disk drive. Runs all of the 3,000 plus pieces of software for the Commodore 64. List $249.00 **SALE $179.95**

COMMODORE 128 COMPUTER

SALE $299.00 List $399

This powerful 128K computer has three modes. One for C-64 software, one for C-128 software, and one for CP/M business software. List $399.00 **SALE $299.00**

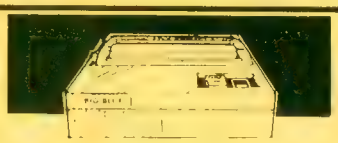
340K 1571 DISK DRIVE

SALE $259.00 List $349

Double sided, single disk drive for the C-128 allows you to use the C-128 mode plus CPM mode. 17 times faster than the 1541, and runs all the 1541 formats. List $349.00 **SALE $259.00**

BIG BLUE PRINTER

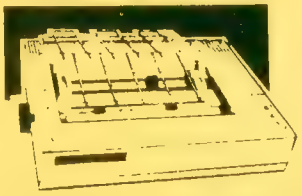
SALE $ 39.95 List $199



This is the affordable printer you have been waiting for! This 8½" letter size, 80 column dot matrix, heat transfer printer features upper and lower case, underline, graphics, word processing, and much more. List $199.00 **SALE $39.95**

PREMIUM QUALITY 150-170 CPS COMSTAR AERO 160 PRINTER

SALE $199.00 List $499



The Comstar Aero 160 gives you a 10" carriage, 150-170 CPS, 9x9 dot matrix with double strike capability for 18x18 dot matrix (near letter quality), high resolution bit image (120x144 dot matrix), underline, back spacing, left and right margin setting, true lower descenders with super and subscripts, prints standard, block graphics and special characters. It gives you print quality and features found on printers costing twice as much! (Centronics Parrallel Interface) List $499.00 **SALE $199.00**

PRINTER/TYPEWRITER COMBINATION

SALE $199.95 List $299

Superb Silver Reed letter quality daisy wheel printer/typewriter combination, just a flick of the switch to interchange. Extra large carriage, typewriter keyboard, automatic margin control, compact, lightweight, drop in cassette ribbon! (90 day warranty) Centronics Parrallel Interface is built in. List 299.00 **SALE $199.95**

COMSTAR 1000 PRINTER

SALE $179.95 List $349

This is one of the best values today. Print letters, documents, ect., at 100 characters per second or 20 cps in Near Letter quality mode. Features are dot addressable graphics, adjustable tractor and friction feed, margin settings, pica, elite, condensed, italics, super & subscript, underline, bold, and double strike. Commodore Interface Included. List $349.00 **SALE $179.95**

12" 80 COLUMN MONITOR

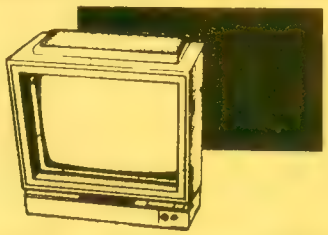
SALE $ 79.95 List $129

Super High Resolution green screen monitor. 80 columns x 24 lines, easy to read, plus easy reach adjust knobs. Supreme Quality. Fantastic value. (cable $9.95) List $129.00 **SALE $79.95**

13" COLOR MONITOR

SALE $139.95 List $329

This premium quality monitor comes with speaker and audio hook up, High Resolution, clear screen, 40 columns x 24 lines, front panel controls and more. Also be use with VCR. One year Ltd. warranty. (cable $9.95) List $329.00 **SALE $139.95**



14" RGB & COMPOSITE COLOR MONITOR

SALE $237.00 List $399

Must be used to get 80 columns in color with 80 column computers (C128 - IBM - Apple) (RGB cable $19.95) Add $14.50 shipping. List $399.00 **SALE $237.00**

TV TUNER

SALE $ 49.95 List $130

This tuner has dual UHF/VHF selector switches, mute, automatic fine tuning and computer/TV selector switches. Hook it up between your computer and monitor! Inputs included for 300 ohm, 75 ohm, and UHF. List $129.95 **SALE $49.95**

CALL BEFORE YOU ORDER:
• OUR PRICES MAY BE LOWER & AND WE OFFER SPECIAL SYSTEM DEALS •

ATTENTION

COMPUTER CLUBS • DEALERS

We offer big volume discounts!

CALL TODAY

PROTECTO

We Love Our Customers

22292 N. Pepper Rd., Barrington, Illinois 60010

(312) 382-5244 to order

in your INPUT message, the computer sends out a message of its own—?EXTRA IGNORED—after the offending character.

You're probably thinking, "Big deal. I type in a message and the computer prints it right out. What's this useful for?"

Not much, superficially. But remember—we have assigned a string variable, A$. In the immediate mode—that is, now, without a line number—type PRINT A$ and press RETURN. Bingo! Your message is printed again. Any time you want your message displayed on the screen, whether in immediate mode or within a program, just type PRINT A$. To see another use for INPUT, type NEW, then this two-line program:

```
10 INPUT"WHAT'S YOUR NAME";
   A$
20 PRINT"HI, "A$
```

Suddenly the computer gets smart. INPUT features the ability to print a message while it waits for the user to type something. Also, INPUT includes a complimentary question mark, as we've seen, so it doesn't have to be in your message. Remember to include the semicolon when you use INPUT like this—it's mandatory.

```
30 PRINT A$" IS SMART!"
40 PRINT A$" IS FANTASTIC!"
50 PRINT A$" IS TALENTED!"
```

Now run your program.

What INPUT always looks for is a variable. It may appear right after the word INPUT with no punctuation, as INPUTA$, or it may appear after a quotation mark and semicolon, as in line 10 above. The variable may be numeric or string. Add these two lines to the program:

```
60 INPUT"HOW OLD ARE YOU";A
70 PRINT A$" IS"A"YEARS OLD
   !"
```

Look carefully at the general construction of these two lines. When the computer encounters the variable A in line 60, it expects you to type a number instead of a letter (unlike string variables, which don't care). In fact, if you do type a letter and press RETURN, the cryptic message ?REDO FROM START pops up. This is not a syntax error—it is Commodore's inimitable way of telling you that the computer is expecting a number. If you see this message, all you have to do is type a number.

In line 70, IS (with a leading space) and YEARS OLD! are inside quotation marks—they're printed literally. But variables A$ (your name) and A (your age) are outside the quotes; the computer searches its memory for values to spit out when it encounters these variables.

If you have any questions on this very common BASIC construction, study the subtle ways numeric and string variables are handled and the way punctuation is used.

The Elves' List

The INPUT statement may ask for more than one value, in which case they may be numeric, string, or mixed. NEW the program in memory and type in this one:

```
10 PRINT"{CLR}"
20 PRINT"FIVE NICE FRIENDS'
   NAMES"
30 PRINT
40 INPUT A$,B$,C$,D$,E$
50 PRINT
60 PRINT"FIVE NAUGHTY FRIEN
   DS' NAMES"
70 PRINT
80 INPUT F$,G$,H$,I$,J$
90 PRINT"{CLR}"
100 PRINT"NAUGHTY",,"NICE"
110 PRINT
120 PRINT A$,,F$
130 PRINT B$,,G$
140 PRINT C$,,H$
150 PRINT D$,,I$
160 PRINT E$,,J$
```

In keeping with the Christmas spirit, what we have here is an Elves' List, which demonstrates a number of points about PRINT and INPUT.

Line 10 clears the screen and sends the cursor home. The first message is printed in line 20. Line 30 prints a blank line for readability. Line 40 is our first multiple INPUT statement—it waits for the user to type in five strings (A$–E$); press RETURN for each.

Lines 60–80 repeat the format of 20–40, but with a different message and five more string variables, F$–J$. Time to clear the screen and home the cursor again in line 90. Line 100 prints the heading for the complete list.

Note especially the two commas between NAUGHTY and NICE; these put the headings in two columns, but the extra comma puts an extra blank column between the two.

Line 110 prints a blank line after the heading, then lines 120–160 print out the strings. Again, note the two commas between the string variables' names; these make the name lists fall directly under the appropriate heading.

We've covered a lot of semi-tricky ways that INPUT and PRINT can work with each other, as well as with numeric and string variables. The only way to master these is to practice and experiment. Don't be afraid to try things which you don't fully understand. Analyze them and you will.

And Merry Christmas—we'll see you again next month.

COMPUTE!'s GAZETTE
TOLL FREE
Subscription
Order Line
1-800-247-5470
In IA
1-800-532-1272

To receive additional information from advertisers in this issue, use the handy reader service cards in the back of the magazine.

RUSH ME

COMPUTE!'s Gazette Disk

YES! I want to save time and money. Please enter my subscription to *COMPUTE!'s Gazette Disk.*

☐ Save 55% off the single issue price. 1 year subscription, **$69.95.**

☐ Save even more! 2 year subscription, **$129.95.**

All *Disk* orders must be prepaid.

☐ Payment enclosed (check or money order)
☐ Charge ☐ MasterCard ☐ Visa American Express (Call 1-800-247-5470)

Acct. No._____ Exp. Date_____

Signature _____

Name _____

Address_____

City_____ State_____ Zip_____

(Outside U.S. and Canada, add $36.00 per year for shipping and handling.)

N Please allow 4-6 weeks for delivery.

J1205

NO POSTAGE
NECESSARY
IF MAILED
IN THE
UNITED STATES

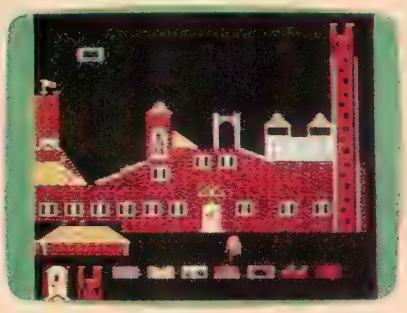
BUSINESS REPLY MAIL
FIRST CLASS PERMIT NO. 7480 DES MOINES, IOWA

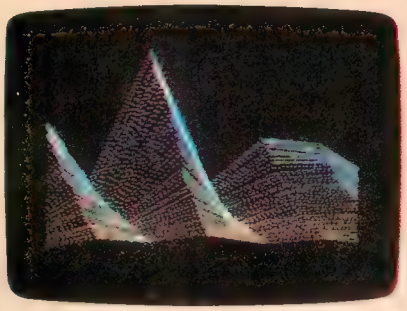
Postage Will Be Paid By Addressee

COMPUTE!'s
GAZETTE
DISK
PO BOX 10960
DES MOINES, IOWA 50347

BUILT FOR SPEED

Now Get Inside Your Commodore with *COMPUTE!'s Gazette Disk.*





Now there's a way to get all the exciting, fun-filled programs of ***COMPUTE!'s Gazette***—already on disk—with ***COMPUTE!'s Gazette Disk***.

Subscribe today, and month after month you'll get a new, fully-tested 5¼-inch floppy disk guaranteed to run on your Commodore 64, Commodore 128, or VIC-20 personal computer.

COMPUTE!'s Gazette Disk brings you all the latest, most challenging, most fascinating programs published in the corresponding issue of ***COMPUTE!'s Gazette***. So instead of spending hours typing in each program, now all you do is insert the disk...and your programs load in seconds.

RESULT: You have hours more time to enjoy all those great programs which appear in ***COMPUTE!'s Gazette***—programs like Disk Editor, Face-Off, Turbo Copy, Arcade Baseball, Sound Designer, SpeedScript, and hundreds of others.

So don't waste another moment. Subscribe today to ***COMPUTE!'s Gazette Disk*** at this money-saving price. Take a full year's subscription for just $69.95. You save 55 percent off the single issue price. Subscribe for two years and save even more! Return the enclosed card or call toll-free 1-800-247-5470 now (in Iowa call 1-800-532-1272).

Individual issues of the *Disk* are available for $12.95 (plus $2.00 shipping and handling) by calling 1-800-346-6767 (in NY 1-212-887-8525).

Video Setup
Part 1

Jim Butterfield, Associate Editor

This program provides you with all the information you need to create a custom screen—with characters or in high resolution—for the Commodore 64. Next month's installment will cover the 128.

When you want to set up a special video screen, the arithmetic can get difficult, and there are pitfalls that may be hard to see. "Video Setup 64" helps you with the screen positioning calculations.

The regular 64 text screen is good enough for many applications. But sometimes you want to make your own character set or do high-resolution work. Or you might be planning dual screens, where you switch from one to another; such an arrangement could be useful for a help screen, for animation, for scrolling by switching from one screen to another, or even for split-screen work.

Video Setup 64 won't do all the work, of course. Character-set and sprite construction is up to you; this program just helps allocate the space you'll need for all the elements of the screen. If you plan to use two screens in a program, you'll need to run Video Setup 64 twice; once for each screen. You'll then have two sets of POKEs to switch in each screen.

Advanced features, such as split-screen work, call for much more programming—and understanding—than Video Setup 64 can give. The program helps you with the arithmetic work, but after that it's up to you.

Running The Program

Before we start experimenting, type in and save a copy of Video Setup 64. Then load it and type RUN. Video Setup 64 first asks what type of screen you'd like to set up. Is it text (characters) or high resolution? If it's text, do you want the standard character set? Your answers affect the questions that follow.

All of the data for your screen—screen memory, character set, and sprites—must reside within a single 16K block of RAM memory. If you want the standard character set, you must choose block 0 or 2—addresses 0–16383 or 32768–49151—since those are the only ones where the character ROM is visible to the video chip. If you don't want standard characters, you may be better off in blocks 1 or 3 (addresses 16384–32767 or 49152–65535) so that the standard character ROM doesn't clutter your available video memory space.

If you're creating a text screen and have decided on a custom character set, you'll be asked to choose a site for it; this area is called the *character base*. Keep in mind that the computer allocates enough space for 256 characters to be defined; if you don't need that many, you don't have to use the entire memory area for character definitions. If you specify that you want the regular character set, the computer knows where to find it.

If you're using a text screen, you'll be asked to pick a location for screen memory, formally called the *video matrix*. You're offered safe addresses—those not used by other video elements.

If you're doing a high-resolution bitmapped screen, you'll be asked for the screen area (the character base or bitmap) and the color memory area (the video matrix). It's interesting to note that you're really supplying the same information as you would for text, but the two areas now play different roles.

That's it. When you press Y to tell the program that you're ready, the computer gives a summary of the areas used and the POKEs needed to create them. Video Setup 64 gives a cautionary note if there's a danger of your screen area conflicting with BASIC (if you've chosen memory area from 53248 to 57343, which is hard to get at; it's possible, but not easy).

Sprite information is also supplied if you choose to see it.

A First Run-Through

Let's look through this program and use it to set up something trivial—the 64's normal screen. At first, this seems silly—we already have this screen. But when we work through the numbers, we'll get the POKEs that will help us to get back to this configuration from any other.

Enter responses as follows: 1 for characters, N for building your own character set. Then select memory area 0 (addresses 0–16383). Finally, choose video matrix 1 (screen memory is normally at locations 1024–2047).

Now get out your pencil and pad. Here's what you see:

```
VIDEO MATRIX: 1024 TO 2047
(SPRITE POINTERS AT 2040 TO 2047)

POKE 56576,7
POKE 53272,20
POKE 648,4
POKE 53265,27
```

Each POKE statement has a small explanation of its purpose.

You should now see the question "Will you want sprites?"

Love at first write.

New! Now with Near Letter Quality printing!

Commodore 64® and 128™ owners, meet the personal printer of your dreams.

It's the Commodore-compatible OKIDATA 120. And it's got everything you've been looking for in a printer.

Like a Near Letter Quality speed of 30 characters per second. A Utility mode speed of 120 cps. And high-resolution graphics.

The OKIDATA 120 is built for long-term relationships. With a full one-year warranty, and a printhead life of 200 million characters.

You'll love the very affordable price, too.

The OKIDATA 120 comes complete with everything you need to start printing. Including its own interface cable, paper and self-inking "Clean Hands" ribbon cartridge. Simply plug it in and you're ready to go.

Meet the printer of your dreams at your OKIDATA retailer now. For the name of the OKIDATA retailer nearest you, call 1-800-OKIDATA.

The OKIDATA 120. To you, it's a great printer. To your Commodore, it's Mr. Write.

OKIDATA®
an OKI AMERICA company

We put business on paper.

OKIDATA is a registered trademark of Oki America, Inc. OKIDATA, Marque déposée de Oki America, Inc. Commodore 64 is a registered trademark of Commodore Electronics Ltd
Commodore 128 is a trademark of Commodore Electronics Ltd

Answer Y and note that there are three areas in which sprite drawings may be placed.

The program warns you that BASIC normally occupies memory that we might choose to use for sprites; in this case, there's no conflict with the video matrix. You could choose to relocate the BASIC work area; that would involve changing a pointer at addresses 43 and 44 and commanding NEW—but that's outside the scope of Video Setup 64.

We don't need to perform any of these POKEs now, since our 64 is already set to these values, but we'll keep them in mind.

Our First Real Task

Suppose someone with an old PET/CBM machine asked you whether you could adjust the 64's architecture to match their machine. Why might they ask? Perhaps they have some neat PET programs that use screen POKEs, and the screen on the 64 is in a different place. More importantly, if you can match the PET architecture, programs saved from your 64 can be loaded on a PET/CBM. The older machines can't relocate programs, so they must be saved from the same address to which they will be loaded.

First, the video information: 1 for characters, N to build your own character set, memory area 2, and video matrix 0 to put the screen at address 32768. Plug this into Video Setup 64, and we get:

VIDEO MATRIX: 32768 TO 33791
(SPRITE POINTERS AT 33784 TO 33791)

```
POKE 56576,5
POKE 53272,4
POKE 648,128
POKE 53265,27
```

These POKEs move the screen as desired. Note that the last POKE—the one to location 53265—is the same value as for a normal 64 screen, so we really don't have to do that one.

But we're not done yet. On the PET/CBM, the BASIC area goes from 1025 to 32767. Now that we've liberated the screen from area 1024–2047, we can move the start-of-BASIC pointer to align with the PET. We'll do this with:

POKE 1024,0:POKE 44,4:NEW (don't do this yet).

What about the end of BASIC? On the 64, this goes up to location 40959. But we can't allow this, since our newly positioned screen is in the way (it starts at location 32768, remember?). So we change the end-of-BASIC pointer (addresses 55 and 56) with the command:

POKE 55,0:POKE 56,128:CLR

Let's put this all together into a simple program to imitate the PET's memory architecture. NEW must be the last command, so we write:

10 POKE 56576,5:POKE 53272,4:POKE 648,128 (from Video Setup 64)
20 POKE 55,0:POKE 56,128:CLR (trimming end of BASIC)
30 POKE 1024,0:POKE 44,4:NEW (moving start of BASIC)

Type RUN. Nothing seems to happen, except that the screen gets messy. This happens because we've switched to a new screen memory and haven't cleared away what was there before. To solve the problem, add this line: 15 PRINT CHR$(147), or just clear the screen now.

But something else has happened also. PRINT FRE(0) reveals that we have been trimmed back to 31741 bytes of BASIC memory—matching that of a 32K PET/CBM. POKE 32768,1 puts a letter *A* in the upper left corner of the (newly relocated) screen. If it doesn't, then you have a 64 model which needs an additional POKE to color memory—try POKE 55296,7 to make it turn yellow.

Programs saved from this reconfigured 64 will load on a PET/CBM.

Going Back

How do we return to a normal 64 configuration? We could just switch the machine off and back on, of course. But we'll follow through the same logic with this program:

10 POKE 56576,7:POKE 53272,20:POKE 648,4 (from Video Setup 64)
20 POKE 55,0:POKE 56,160:CLR (resetting end of BASIC)
30 POKE 2048,0:POKE 44,8:NEW (moving start of BASIC)

Type RUN and you'll be back, with a new messy screen.

A Memory Tour

Let's take a quick tour of memory to identify the areas that might be a bit tricky when you're doing video work.

The first 256 locations—0–255—are sensitive and important. The operating system needs this area: Leave it alone.

From 256 to 1023 we have working areas, including the stack, buffers, pointers, and other odds and ends. It might be possible to slip a few sprites in here, but you'll need to be careful and check with a memory map for possible conflicts.

Address range 1024–2047 is where screen memory is normally located. From 2048 up to 40959 we find the area used for BASIC—the BASIC program together with its working values (variables, arrays, and strings). But there's a hitch. The video chip can never see RAM from 4096 to 8191 or from 36864 to 40959. Instead, the character ROM is planted at these video locations. Good if you want standard characters, but not for drawing your own art.

At addresses 40960–49151, the video chip is happy to use the RAM, but BASIC programmers have a special problem. A POKE stores to this RAM, but a PEEK won't see it. That's because ROM (the BASIC interpreter) also lies at this address. It would take some special finagling with address 1, using machine language programming, to make the ROM disappear. But in many cases, you don't need to worry—you'll want to store to the screen, but won't need to read it back.

Addresses 49152–53247 are easily accessible.

The area from location 53248 to location 57343 is quite hard to get at, since it conflicts with the I/O chips. For example, remember the screen background POKE at address 53280? You would need to disconnect the I/O to get at this area, and that takes very careful work indeed. It can be done, but it's not practical for BASIC programmers.

From 57344 to 65535, the top of memory, we have a situation similar to that of location 40960: ROM (the Kernal system) makes it easy to POKE to this RAM but difficult to PEEK. Again, this may not be a problem for you.

Video Setup 64 is handy for screen arithmetic. It helps with much more than the simple exercises we've tried in this article. You'll really appreciate it next time you need to work with graphics and custom character sets.

See program listing on page 140.

PaperClip™

"The #1 Best Selling Word Processing Package" – BILLBOARD'S COMPUTER SOFTWARE CHART*

PAPERCLIP II
FOR THE COMMODORE 128

NEW! Only $79.95*

- Compatible with C-64 PaperClip files: the natural choice for C-128 upgrades
- Includes integrated 38,000-word spelling checker
- Built-in telecommunications module: access on-line services, incorporate on-line data in your work, and send text to other users
- New editing features include multiple columns, reverse video scroll, chaptering, powerful macros
- Maximum document size expanded to 999 lines

PAPERCLIP *FOR THE APPLE IIe, c*

- Insert/Delete, Move & Copy, Cut & Paste, Global Search & Replace
- Automatic page numbering, headers and footers
- Simplified columns, tabbing and scrolling
- Form letter and mailing label functions
- Unique new capabilities for Apple: dual text windows, automatic text protection, macro commands and more

PAPERCLIP
FOR ATARI HOME COMPUTERS (WITH SPELLPACK FOR THE 130 XE)

- All the high-productivity editing features plus: Dual Text Windows, Automatic Paging, Macros and much more
- Fully-integrated SpellPack spelling checker on the same disk
- 36000 words in the SpellPack dictionary plus you can add thousands more
- Memory-resident for speed and convenience: no need to quit the word processor to check a document

PAPERCLIP with SPELLPAK
FOR THE COMMODORE 64

- Built-in spelling checker
- All the high-productivity text editing features
- Move, Copy, Insert, Delete — words, sentences or entire blocks of text
- Macro power: define & store up to 52 repetitive words/phrases, then enter them with just one keystroke
- Includes 80-column Print Preview display, requires no extra hardware
- Sophisticated Global Search & Replace, Mail Merge and Mailing Label functions

PAPERCLIP ELITE *FOR THE ATARI ST and COMMODORE AMIGA*

- Go beyond word-processing, with idea processing, text/graphics integration, real-time spell checking, independent variable columns and so much more. Look for PaperClip Elite. Coming soon.

"you can't go wrong choosing Paper Clip"
– THE GUIDE TO COMPUTER LIVING

"the Cadillac of word processors."
– OMNI MAGAZINE

"best professional word processor available"
– RUN MAGAZINE

"by far the best word processor ever available . . . So clearly superior, . . . State-of-the-art word processing"
– ANTIC

"as far as we are concerned, PaperClip is the top word processor running on a micro computer."
– HOME APPLICATIONS FOR THE C-64

"Performance: excellent. Error-handling: excellent. Value: excellent. . . You'll find yourself growing spoiled."
– FAMILY COMPUTING

"Exceptional word processing. . ."
– INPUT

"many features . . . easy to use"
– ATARI EXPLORER

"A superb word processor . . . the most sophisticated to date."
– COMPUTE MAGAZINE

". . . the ultimate word processor
– ANALOG MAGAZINE

"One of the easiest of the professional word processors . . . a sensible manual . . . plenty of aids for the accident prone."
– COMPUTING NOW

"An excellent word processor . . . well designed . . . many advanced features."
– INFOWORLD

"a "must have" in an ideal software library"
– ELECTRONIC LEARNING

". . . most powerful of packages"
– COMMODORE MAGAZINE

"PaperClip is a logical evolutionary step forward."
– AHOY

". . . facts attest to its excellence!"
– FAMILY COMPUTING

BATTERIES INCLUDED

BATTERIES INCLUDED, an ITM company, 30 Mural Street, Richmond Hill, Ontario, Canada, L4B 1B5 (416)881-9941, Customer Information (416)881-9816. If you can't find this product at your local retailer, you may order it direct from us at the full suggested list price plus $5.00 for postage and handling. For product orders please call 1-800-387-5707 (U.S. only). For most Batteries Included products you can always have the latest version of your program by returning the original disk and $10.00. Write to us for our full color catalog of products for the APPLE, APPLE MACINTOSH, ATARI, ATARI ST, COMMODORE, COMMODORE AMIGA, AND IBM SYSTEMS.

© 1986 Batteries Included. APPLE, APPLE MACINTOSH, ATARI, ATARI ST, COMMODORE, COMMODORE AMIGA, AND IBM are registered trademarks respectively of APPLE COMPUTERS INC., ATARI CORPORATION, COMMODORE BUSINESS MACHINES INC., AND INTERNATIONAL BUSINESS MACHINES INC.

Some features may vary with computer system used.

*AS COMPILED FROM NATIONAL RETAIL SALES REPORTS. US SUGGESTED LIST PRICE. RETAILERS MAY SELL FOR LESS.

Integral Solutions

Fast Hi-Res Screen Dump

Robert F. Mills

This machine language program prints out screen dumps at high speed when used with the Epson, Gemini, and compatible printers. For the Commodore 128 and 64.

The "Hi-Res Dump" program in the July 1986 GAZETTE prints out excellent copies of whatever is on the hi-res (high-resolution) screen. Unfortunately, the program is very slow when used with a non-Commodore printer like my Gemini 10X with its Cardco +G interface. The interface emulates the Commodore graphics commands well—but the process is slow and it gives the printhead quite a workout. So, I dug out my printer manual to learn more about its built-in graphics capabilities. "Fast Hi-Res Dump" is the result.

Although I wrote this program for my Gemini printer, it also works with most other Star Micronics models, and with most Epson printers as well. In fact, the program will work with most any printer that uses the ESC K *n1 n2* sequence for printing graphics. Refer to the owner's manual that came with your printer for details of its built-in graphics capabilities. (If you have a Commodore printer, do not type this program in. *It will not work with any Commodore printer.*) Regardless of the printer used, you must also have an interface which allows a transparent mode of operation. Transparent mode makes the interface pass all characters to the printer without modification. This gives you control over the printer's special built-in functions. This program uses the Cardco convention whereby a secondary address of 4 in the OPEN statement specifies transparent mode. For other interfaces, it may be necessary to set a switch on the interface to select transparent mode. This program does not work with most third-party printers that have built-in Commodore interfaces, such as the Star SG-10C or Gemini II.

Printing A Screen

Fast Hi-Res Dump is relocatable, so you can put this program nearly anywhere in RAM. The BASIC loader program will place the machine language at any address you request. On the 128, either of the RS-232 buffers (starting addresses 3072 or 3328) provide excellent areas if you won't be using an RS-232 device. The free memory starting at 4864 can also be used. For the Commodore 64, the free memory beginning at address 49152 is a good place to put this routine if your screen or another program isn't located there. The program is 221 bytes long, so it won't fit in the cassette tape buffer.

Type in and save a copy of the loader program before running it. When you run the loader, you'll be asked to specify a starting address for the dump routine. The loader then POKEs the values into that area and checks for errors. Anytime you want to dump the image on the hi-res screen to the printer, just SYS to the address you specified for the dump routine. For example, if you placed the Fast Hi-Res Dump routine at 49152, use SYS 49152 to dump your graphics screen. This can be done either in direct mode or within a program. The dump takes just over a minute. On the 128, you can BSAVE (binary save) the routine and then BLOAD it wherever you wish without having to use the loader program again. For example, if you told the loader to place the routine at address 3072 ($0C00), the RS-232 input buffer, you could save a copy of the routine with:

```
BSAVE "FASTDUMP",P3072 TO P3293
```

Then when you want to use the routine, just BLOAD "FASTDUMP" and SYS 3072. Or, if you have another ML program residing at 3072, you can use BLOAD "FASTDUMP",P *address* and SYS *address*, where *address* is some other free ML area. For the 128, make sure that the routine is loaded into a bank configuration where Kernal ROM is visible (bank 15, for example).

Behind The Dump

Fast Hi-Res Dump is written entirely in machine language. First, the program opens a channel for talking to the printer (equivalent to OPEN 4,4,4 in BASIC). The secondary address of 4 puts the Cardco +G interface in transparent mode with line feeds. If you don't have a Cardco interface, you may need to change the DATA in line 70. Replace the 4 in that line with the secondary address value that puts your interface into transparent mode. (You can ignore this change if your

UNLEASH YOUR CREATIVE GENIUS

Activision Creativity Software gives you all the tools you'll ever need.

Like ***The Music Studio.***™ Compose and edit any musical score quickly and easily using features and power unmatched by other music programs. Mozart never had it so good!

Deck the halls! ***Paper Models™: The Christmas Kit***™ turns your computer into Santa's workshop. Three-dimensional decorations including ornaments, gift boxes, and Christmas villages are yours at the touch of a key. Decorate using the clip-art library or customize your own with the paint program.

Picture this. ***Paintworks,***™ the easy-to-use, complete graphics editor and paint program. Lets you design cards, stationery, newsletters, musical slideshows, or just plain doodle. Features color cycling for animation effects, 3 work screens, multiple brushes and instant color blending to bring out the artist in you.

Have a great idea for a game? With Garry Kitchen's ***GameMaker™: The Computer Game Design Kit,***™ you can create computer games using 5 professional quality design tools in one easy-to-use program. Or get a head start with pre-designed images and effects. The ***GameMaker Designer's Sports Library***™ lets you create your favorite sports games from football and baseball to skiing and auto racing, easily and quickly. With the ***GameMaker Designer's Science Fiction Library,***™ you can create a whole new world, full of spaceships, planets, galaxies, aliens and more. Both libraries for use with Garry Kitchen's GameMaker.

ACTIVISION CREATIVITY SOFTWARE LETS THE CREATIVE GENIUS IN YOU SHINE THROUGH.

ACTIVISION
CREATIVITY SOFTWARE®

For Commodore 64 and 128, Amiga, Apple II series, Atari 800/XE/XL/ST, IBM PC, PCjr, Tandy 1000, Macintosh, and Apple IIGS computers. NOT ALL PROGRAMS AVAILABLE ON ALL SYSTEMS.

Commodore 64, 128 and Amiga are trademarks of Commodore Electronics Limited. IBM is a trademark of International Business Machines Corporation. Tandy is a trademark of Tandy Corporation. Atari ST, XE and XL are trademarks of Atari Corporation. Apple and Macintosh are trademarks of Apple Computer, Inc. Activision is the registered trademark of Activision, Inc. © 1986, Activision, Inc.

printer interface instead requires a switch setting to select transparent mode.) If you do change line 70, remember to change the total in line 40 to reflect the new value. Otherwise, you'll get a false error message when you run the program.

Next, the routine sends the character codes to set up the printer for 8/72-inch (versus the normal 9/72) line feed length to account for the fact that the Gemini print head has nine vertical firing pins. (It's more convenient when working with the Commodore graphics screen to deal with only eight.) Changing the line feed length removes the gaps between the lines.

At the beginning of each column to be printed, the sequence ESC K *n1 n2* is sent to the printer. The expression *n1* + *n2* × 256 gives the number of characters to follow. The program sends ESC K 200 0 for each column because there are 25 rows in the hi-res screen, and each row has eight lines (25 × 8 = 200).

The program prints the screen contents sideways on the paper, with each printed dot corresponding to a lit pixel on the screen. The program scans from the top right corner of the screen down to the bottom right corner, through 25 rows of 8 lines. The address of a particular byte in the screen is (320 × *row*) + (8 × *column*) + *line* + *base*, with *column* ranging from 0 to 39, *row* from 0 to 24, and *line* from 0 to 7. The *base* address is the starting address of the screen bitmap. As written, this is assumed to be 8192 ($2000). If you want to dump a hi-res screen located elsewhere, just change the 32 at the end of line 240 to the high byte of the starting address of your screen. For example, if your screen is at 16384 ($4000), then change the 32 to 64. (As before, you'll also have to adjust the total in line 40 to reflect the new value.)

Note that there is a one-to-one relationship between the printed dots and pixels; this makes the final printed copy about 4 × 5 inches.

Like most hi-res dump programs, this program can't be used to dump text screens or sprites, but its speed, small size, and portability make it a very useful and powerful utility.

See program listing on page 140.

Sprite Locater

Stanley Brewster, Jr.

Even with a sophisticated sprite editor, locating your newly designed sprites can be a tedious chore. This machine language utility makes it easy. For the Commodore 64.

Although sprites are one of the most powerful features of the 64, they are also one of the most difficult to program. Fortunately, there are many good sprite editors available. These editors make sprite design easy, but they don't help you find the right place for them on your screen. "Sprite Locater" makes this chore an easy and simple task.

The Hard Way

The *Commodore 64 Programmer's Reference Guide* explains the process of sprite placement on pages 137–143 and 156–161. The explanations and graphs are well done, but the procedure is tedious. In order to place a sprite, you must know the row and column number of the character position where you wish to place it, and then add offsets according to the pixel position within that character. Most programmers just skip this method and use a trial-and-error approach. With Sprite Locater, you can use a joystick to find the perfect place for your sprite.

Type in and save a copy of the program. After you've done this, load it and type RUN. A crosshairs sprite appears. Use a joystick in port 2 to move the sprite. Its position is displayed on the top line of the screen. If you move the sprite from left to right across the screen, you'll see that as you get approximately two-thirds of the way across the screen, the *x* position drops abruptly from 255 to 0. To the right of this imaginary line you must set the appropriate seam bit as well as setting the reported *x* and *y* locations. The seam bit is the ninth and highest bit specifying the horizontal position of a sprite—necessary because there are more than 256 possible horizontal positions. All eight sprites have seam bits in location 53264/$D010. Refer to the *Programmer's Reference Guide* for more information.

The speed of the sprite cursor is also displayed. Change the speed by pressing the fire button on the joystick. Use speed 1 (the fastest) to quickly traverse the screen. Use speed 15 (the slowest) when trying to home in on the exact spot for your sprite. Press any key to end the program.

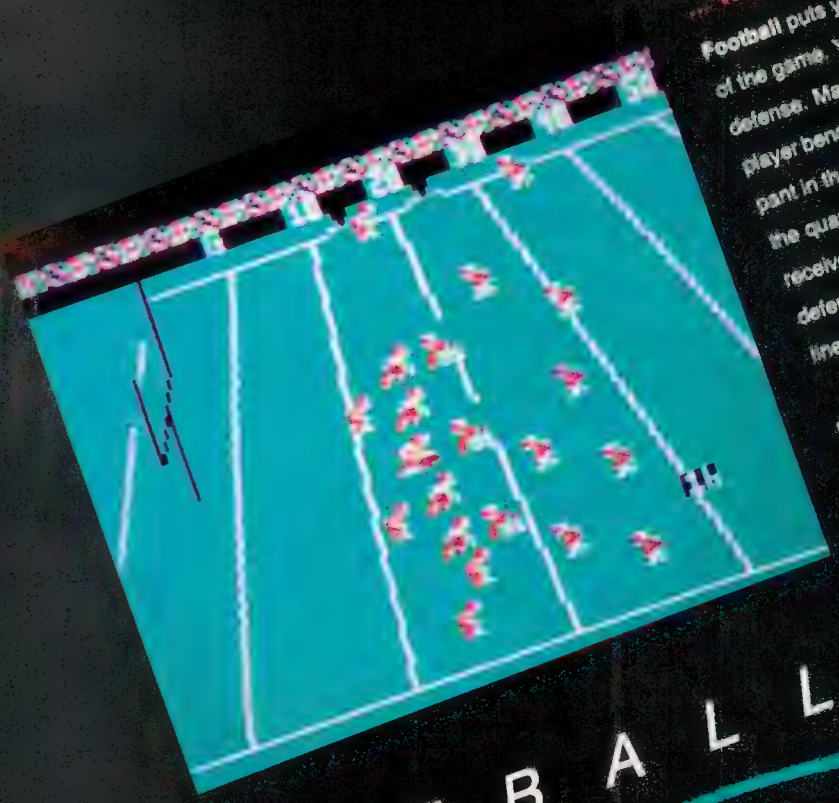
On Your Own

The best way to use Sprite Locater is in conjunction with a previously designed background scene. For example, if your screen is a room with a stool in it and your sprite is a cat, you can find the correct coordinates for your sprite simply by using the joystick to put the cat on the stool. Here's how to do that: Load and run Sprite Locater. Exit the program by pressing any key. Load your background scene, making sure not to disturb memory above 49152—the address of Sprite Locater. Type SYS 49152 to restart the program. You may now move the sprite around the screen and note its location. Of course, you'll want to substitute your own sprite data in the program for mine.

You can also append this program to your own, but be aware of potential memory conflicts. The program uses RAM locations 832–895 for sprite information and locations 49152–49486 for the sprite-position reporting routine.

See program listing on page 130.

FOOTBALL



...With Spectacular Results!

Football puts you in control of every aspect of the game. You call the plays, offense and defense. Make substitutions from your 18-player bench. Then become an active participant in the play you've selected. You control the quarterback, then the running back or receiver once the ball is transferred. On defense, you become the in-action safety or linebacker for the play you've selected.

Discover how enjoyable a football simulation game can be. You will agree that **Football** is the first real football game on a computer. Available on disk for the Commodore 64/128 computers.

See Your Dealer ...

or write or call for more information. For direct order please enclose $39.95 plus $2.00 for shipping and specify UPS or first class mail delivery. Visa, MasterCard, American Express, Diners Club cards accepted.

Commodore 64 and Commodore 128 are trademarks of Commodore Electronics, Ltd.

subLOGIC Corporation
713 Edgebrook Drive
Champaign IL 61820
(217) 359-8482 Telex: 206995

Order Line: (800) 637-4983
(except in Illinois, Alaska, and Hawaii)

A True-to-Life Simulation ...

Forget everything you've seen or heard about sports simulation programs; **Football** sets new standards in realism and playability by simulating the real physics of the game.

Every offensive and defensive player has individual physical attributes (speed, power and catching ability). Each quarterback's passing abilities are different. Players act and move individually on each play. And you can adjust the performance characteristics of any player, any way you like.

Football's overhead 3D perspective gives you a clear view of the entire field. The ball carrier is always highlighted for easy identification. And **Football's** real-time 30-second clock means fast-moving action from start to finish, with no game-slowing disk access.

PASS TO FLANKER POST PATTERN

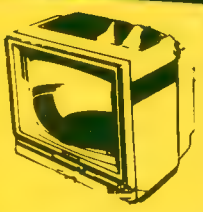
COMPLETE PASS TO TIGHT END

PRO-TECH TRONICS

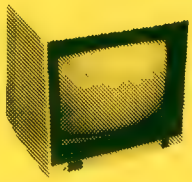
MONITORS

RETAIL $120

$59



GREEN SCREEN



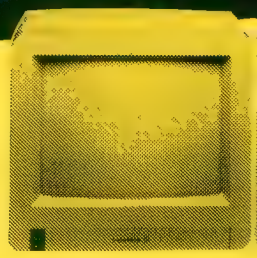
RETAIL $299

$99

FULL COLOR

RETAIL $400

$199



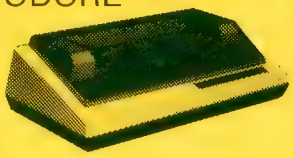
RGB

PRINTERS

RETAIL $200

$69

COMMODORE



FREE TRIAL PERIOD

TYPEWRITER QUALITY

RETAIL $349

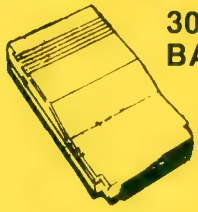
$139

DISK DRIVE

1541 COMMODORE

$139

MODEMS



300 BAUD

$28

$88 1200 BAUD HAYES

FREE HOME TRIAL

POWER SUPPLY

$39

FOR THE **C-64**

DATA SET

$28

JOY STICKS

$9

SURGE PROTECTOR

$28

CALL TODAY
OPEN 7 DAYS A WEEK & EVENINGS

1-800-345-5080

IN MINNESOTA 612-560-6603

COMMODORE

C-64 COMPUTER

$99

*WITH PURCHASE OF SPECIALLY PRICED SOFTWARE PACKAGE

COMPUTER

WITH GEOS

$188

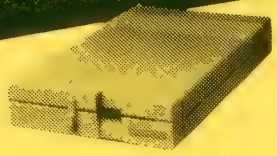
COMMODORE C-64C

128 COMMODORE SYSTEM

COMMODORE 128

$199

WITH PURCHASE OF 1571

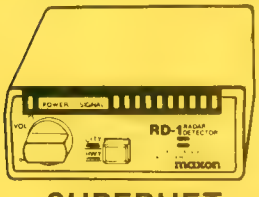


1571 DISK DRIVE

$258

RADAR DETECTOR

HIGH PERFORMANCE



SUPERHET

RETAIL $249

$78

FREE TRIAL PERIOD

CABLE TV?

NO PAY TV

CONVERTERS/ DECODERS
- JERROLD
- OAK
- HAMLIN

CALL TODAY FOR PRICE

QUICK-DELIVERY

VISA MasterCard AMERICAN EXPRESS C.O.D.

SCHOOL P.O.'s ACCEPTED

6870 Shingle Crk. Pkwy. #103
Minneapolis, MN 55430
(612) 560-6603

machine language for beginners

Richard Mansfield
Senior Editor

Last month we built a small, but potentially useful, program which tests RAM memory. It stores to, then tests, each RAM memory cell by trying out every possible number (0–255) which can be held in a single byte. Then it moves on to the next cell. If any cell fails the test, the program reports the address of that cell and stops.

Now let's modify the program a bit. Let's make it more friendly by adding a message at the start of the program and, to show that it's making progress through the test, let's have it print a dot onscreen each time it completes a *page*, a 256-byte-long unit of memory.

Here's the original program from last month (for the Commodore 128 or 64):

```
10000 LDA     #4
10002 STA     253
10004 LDA     #0
10006 STA     252
10008 TAY
10009 TAX
10010 STA     (252)Y
10012 CMP     (252)Y
10014 BNE     10037
10016 DEX
10017 BEQ     10023
10019 TXA
10020 JMP     10010
10023 INY
10024 BNE     10010
10026 INC     253
10028 LDA     253
10030 CMP     #8
10032 BNE     10010
10034 JMP     10044
10037 LDA     253
10039 LDX     252
10041 JSR     36402 (JSR 48589 for the
                    64)
10044 RTS
```

This version tests just screen RAM because we stuck the limits of the test $0400–$0800 (1024–2048 decimal) right into the program itself. (See 10000–10006 for the starting address and 10030 for the ending address. For a complete description of the program, please see last month's column.)

Do Not Disturb

One of the most rewarding aspects of knowing machine language programming is that you can modify commercial software to suit your needs. You might want to add a feature to your word processor, for example, so it will automatically print addresses on envelopes. But how can we modify a program without disturbing it? The easiest solution is to cause the program to jump to a custom subroutine (outside the memory zones used by the original program) and then replicate the instructions you had to overwrite to cause your JMP.

In "Ramtest," we're going to put JMP 10050 right on top of LDA #4: STA in lines 10000–10002. We're going to cover up the first three bytes of our program with this JMP, print our message, and then (before returning to address 10004) replicate the LDA #4: STA 253 which we patched over.

Here's the new version:

```
10000 LDA     JMP 10050
10003 NOP
10004 LDA     #0
10006 STA     252
10008 TAY
10009 TAX
10010 STA     (252)Y
10012 CMP     (252)Y
10014 BNE     10037
10016 DEX
10017 BEQ     10023
10019 TXA
10020 JMP     10010
10023 INY
10024 BNE     10010
10026 INC     253
10028 LDA     #46
10030 JSR     65490
10033 LDA     253
10035 CMP     #57
10037 BNE     10010
10039 JMP     10049
10042 LDA     253
10044 LDX     252
10046 JSR     36402 (JSR 48589 for the
                    64)
10049 RTS
10050 LDY     #0
10052 LDA     10071Y
10055 BEQ     10064
10057 JSR     65490
10060 INY
10061 JMP     10052
10064 LDA     #47
10066 STA     253
10068 JMP     10004
10071 .... TEXT HERE (SEE BELOW)
```

Enter the program as is if you are using the "Simple Assembler," found in this column in the October issue. For other assemblers, you'll need to enter a comma in front of any Y (for example, 10052 LDA 10071,Y).

The Print Patch

As you can see, the program remains substantially the same, but there are some differences. For one, we are asking the program to check memory from page 47 to page 57, rather than checking screen RAM. And there's that JMP at the start of the program which sends us down to print out our message.

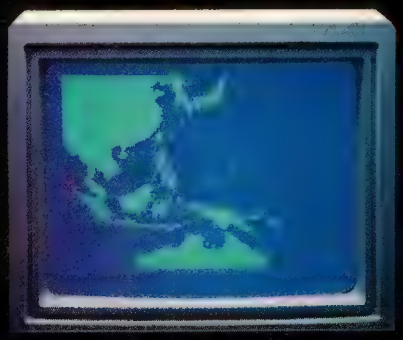
Lines 10050–10068 are new. They're the print-to screen patch. First we put a zero into the Y register so we can use it to pick off each letter of our message (starting with the first letter, the zeroth letter). Then we load in the first character with LDA 10071Y. This means load the character in address 10071 *plus the value of Y*. So, the first time through this loop, we'll load the character at 10071 itself because we put a zero into Y. Our message consists of the letters RAMTEST, which you'll need to POKE into addresses 10071–10077 in the following fashion:

POKE 10071, 82:POKE 10072,65 and so on, using **77,84,69,83,84,** and ending with **POKE 10078,0.**

There are easier ways to do all this, but it's helpful to do things by hand at first, to understand what's involved. That final zero, by the way, is important. It's not a printable character; rather, it tells the computer when our message is finished. Right after we load in each

America's Bestselling Naval Simulation!

Captain's Log . . . War Date 10.01.44



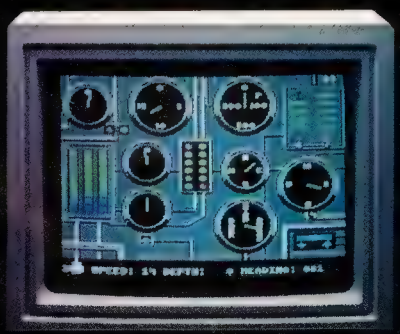
"Captain's Log, October 1, 1944. 0250 Hours. Fleet submarine USS Hammerhead proceeding Southwest at cruising speed. Our mission: intercept enemy convoy off the coast of Borneo. Disperse and destroy."

"0300 Hours. Two hours until dawn. Radar picks up convoy, escorted by two destroyers. We believe that one of the enemy's valuable cargo ships is part of convoy formation."

"0400 Hours. Lookouts on the bridge. Target identification party reports one cargo ship, 4,000 tons, troopship of 10,250 tons, with two *Kaibokan*-type escorts. Moving into attack position."

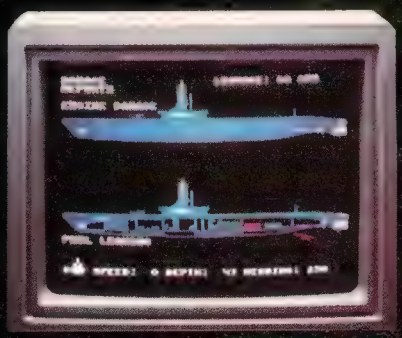
Tandy 1000/IBM PC Jr. screens shown

"0500 Hours. Sound General Quarters! Battle stations manned. Preparing for torpedo run. Gauge Panel OK. Periscope OK. Charts and Attack Plot Board OK. All mechanical systems OK."



"0525 Hours. Torpedo rooms report full tubes forward and aft. Battery at full charge for silent running. We hope water temperature will provide thermal barrier to confuse enemy sonar."

"0600 Hours. We are at final attack position. Convoy moving at 10 knots. Target distance decreasing rapidly . . . Crash Dive! Escorts have spotted us and are turning to attack! Rig to run silent."



"0700 Hours. Depth charged for one hour. Some minor damage, but repair parties at work. Destroyer propeller noises receding. We'll come to periscope depth for our return punch."

"0715 Hours. Torpedo tubes 1, 2, 3 fired. Two destroyers hit and sinking. One of the enemy's last cargo ships coming into 'scope view — an ideal target position. On my mark . . . Fire Tube 4! Fire 5!"

"Superb" raves Scott May in *On Line*, "strategic intensity and heart-pounding action have rarely been merged this successfully." *Analog* calls it flatly "the best submarine simulation so far." *Compute* comments "Silent Service's detail is astonishing." Join the more than 150,000 computer skippers who have volunteered for **Silent Service**, the naval action/tactics simulation — from MicroProse.

Silent Service is available for Commodore 64°128™, Amiga™, Apple II family, Atari XL/XE, Atari ST, IBM PC/PC Jr, and Tandy 1000, at a suggested retail price of $34.95 (Atari ST and Amiga, $39.95).

Commodore, Amiga, Apple, Atari, IBM, and Tandy are registered trademarks of Commodore Electronics, Ltd., Commodore-Amiga Inc., Apple Computer, Inc., International Business Machines Corp., and Tandy Corp., respectively.

Available from your local retailer. If out-of-stock, contact MicroProse directly for further information on our full range of simulation software, and to place Mastercard/Visa orders.

MICROPROSE
SIMULATION SOFTWARE

120 Lakefront Drive · Hunt Valley, MD 21030 · (301) 667-1151

character, we first check to see if it's a zero (via that BEQ, Branch if EQual to zero, in line 10055) and, if so, exit the loop by branching to 10064. However, if we're still printing the message, we JSR to the built-in BASIC print routine to deposit the character onscreen, raise the value of Y by one (INY) so it points to the next character, and JMP back to the start of this little print loop.

When we finish printing RAMTEST, we'll load the zero, thus triggering the BEQ and branch down to store 47 (the start address of our test) into the pointer discussed last month. Then we return to the original testing routine.

One other modification has been made. We've inserted lines 10028–10030 which load the Accumulator with the period (.) character and print it (again using BASIC's print routine). This happens each time we have finished a page of testing.

Eighty-column 128 users can type FAST prior to activating Ramtest. Forty-column 128 owners and 64 users will find that, at normal speed, the program takes about 16 seconds to finish its testing. Start Ramtest by SYS 10000.

All programs listed in this magazine are available on the GAZETTE Disk. See elsewhere in this issue for details.

USE AISLE 12
4 DRIVE UNITS OR LESS
PREPAY ONLY
NO CREDIT ON SERVICE WORK
NO MACHINE WITHOUT THE GREEN
PAY FOR 5 ALIGNMENTS GET 6TH ONE FREE
NOT RESPONSIBLE FOR MISSING FLOPPIES
BE POLITE
EVERYONE HAS TO WAIT
TAKE NUMBER
NOW SERVING
DEPOSIT EACH DRIVE UNIT
SAVE YOUR RECEIPTS
FREE VACUUM CLEANER WITH 200TH ALIGNMENT

Who needs this?

When you can solve disk drive alignment problems in 60 minutes with the CSM program.

Disk drive alignment problems?
Drive out of alignment again?
Tired of waiting two weeks or more to get your drive fixed??

WE HAVE THE ANSWER ! !

With the 1541 DISK DRIVE ALIGNMENT PROGRAM you can align the drive yourself in an hour or so. Not only that, you can do it at home AND no special equipment is required. Anyone with average mechanical skills can do it!!

Read What Compute!'s Gazette had to say. (Oct., 1984)

". . . with 1541 Disk Drive Alignment *from CSM Software, you can fix it* [the disk drive] *yourself in an hour or so and the program will pay for itself the first time you use it...No technical expertise is required to accomplish the alignment procedures, and the manual accompanying the program thoroughly describes the procedures."*

1541 DISK DRIVE ALIGNMENT PROGRAM - VERSION 2.0 - *$44.95 plus shipping*

CARTRIDGE BACKER II

PACKAGE INCLUDES:

1. EXPANSION BOARD, PROGRAM DISK AND USER'S MANUAL.
2. CARTRIDGE BACKER software to back-up 99% of the most popular C-64 cartridges to disk.
3. SOFTWARE TO BACK UP MANY DISK PROGRAMS.
4. SOLD FOR ARCHIVAL USE ONLY!

$54.95 plus shipping

PROGRAM PROTECTION MANUAL FOR THE C-64 VOLUME II

Not just a third edition — a new and up-to-date manual covering the latest advances in program protection. Over 275 pages of valuable information. Topics include:

- *ENCRYPTION AND DECRYPTION*
- *UNDOCUMENTED OPCODES*
- *GCR RECORDING*
- *CUSTOM DOS ROUTINES*
- *CARTRIDGES AND EPROMS*
- *PROTECTING YOUR OWN SOFTWARE*
- *TIPS FROM EXPERTS ON PROTECTION, BACKUP & MORE*
- *DISK INCLUDED*

$34.95 plus shipping

PROGRAM PROTECTION MANUAL FOR THE C-64 VOLUME I

- *A MUST FOR BEGINNERS*
- *THE PERFECT INTRODUCTION TO PROGRAM PROTECTION*
- *DISK INCLUDED*

$29.95 plus shipping

SNAPSHOT 64™

SNAPSHOT 64 is a new utility backup program that literally takes a 'SNAPSHOT' of your computer's memory. This snapshot is then saved to disk with an autoboot so that it may be easily loaded back in. It does all this automatically and easily.

- *EASY TO USE. TAKES ONLY 3 - 5 MINUTES.*
- *BACKS UP MANY MORE PROGRAMS THAN SIMILAR UTILITIES*
- *SOLD FOR ARCHIVAL PURPOSES ONLY*
- *EXCLUSIVE FEATURE - ALLOWS YOU TO STOP MOST PROGRAMS AT ANY POINT, EXAMINE THE COMPUTER'S MEMORY, AND THEN RESTART THE PROGRAM. THIS IS A VERY VALUABLE FEATURE FOR THE HACKER!!*

$49.95 plus shipping

SNAPSHOT ENHANCEMENT DISK

The perfect addition to the best selling memory back up tool. Includes fast loader, cartridge maker, file examiner and more.

$14.00 plus shipping

VISA AND MASTERCARD ACCEPTED

Shipping $3.50 per item in U.S.; foreign orders extra

C= is a registered trademark of Commodore Business Machines, Inc.

Available through your local software dealer or call:

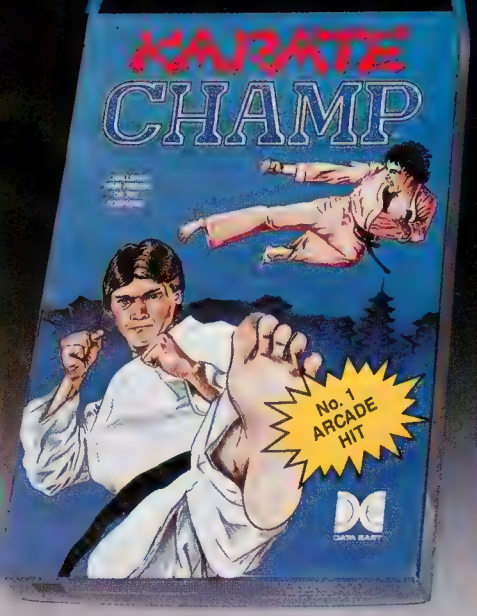
CSM SOFTWARE, INC.

POST OFFICE BOX 563, CROWN POINT IN. 46307, PHONE (219) 663-4335

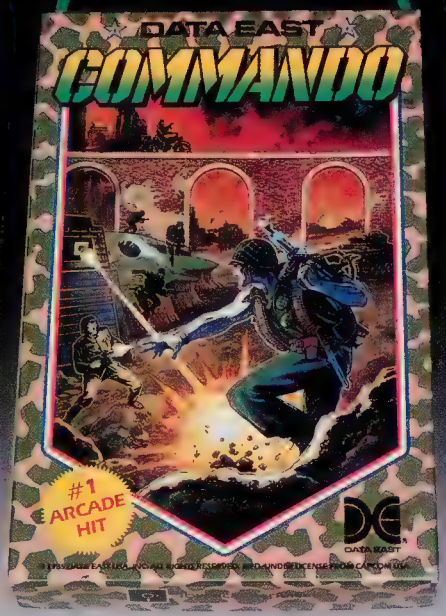
NUMBER ONE ARCADE HITS...

LOOK FOR
Gac Beam WRESTLING™
ON C-64™/128

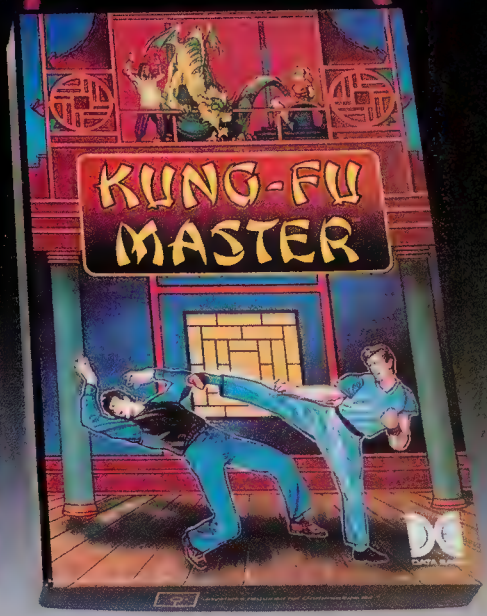
FOR YOUR COMPUTER.



Put on your black belt and challenge your friends or the computer through nine picturesque settings in this leading Martial Arts Game to become the **KARATE CHAMP**. For the Commodore 64™/128 and the 48K Apple II® Series.



As the crack shot **COMMANDO**,* battle overwhelming odds to defeat advancing rebel forces. Armed with only a machine gun and hand grenades, you must break through the enemy lines to reach the fortress. For the Commodore 64™/128.



Prepare for the fight of your life . . . you are the **KUNG-FU MASTER**.** Battle the evil forces through the five dangerous floors in the wizard's castle to rescue the captive fair maiden. For the Commodore 64™/128 and the 48K Apple II® Series.

Apple and Commodore 64 are trademarks of Apple Computer, Inc. and Commodore Electronics, Ltd. respectively.
* © Data East USA, Inc. Mfd. under license from Capcom USA.
** © Irem Corp. Mfd. under license by Data East USA, Inc.

DATA EAST

DATA EAST USA, INC.
470 Needles Drive, San Jose, California 95112
(408) 286-7074
© 1986 Data East USA, Inc. All rights reserved.

Readable Listings

If you've discovered a clever time-saving technique or a brief but effective programming shortcut, send it to "Hints & Tips," c/o COMPUTE'S GAZETTE. *If we use it, we'll pay you $35. We regret that, due to the volume of items submitted, we cannot reply individually to submissions.*

Positioning The Cursor

Douglas W. Brown

There are several ways to put the cursor at a certain location on the screen. You can POKE a couple of locations, SYS to the Kernal PLOT routine, or do something like this:

```
PRINT "{HOME}{DOWN}{DOWN}
  {RIGHT}{RIGHT}{RIGHT}";
```

But what happens when you finish the program, put it aside, and three months later decide you want to add some features?

A program full of POKE and SYS statements isn't very readable—and it's not much fun looking for memory locations in a book, trying to remember what the program was supposed to do. A line full of {DOWN}s and {RIGHT}s isn't very readable, either. The reverse graphics characters that represent cursor movements in quote mode blend together when you have several in one line.

Here's another way to position the cursor. It's not necessarily any faster than other techniques, and it might use up a little more memory. What's good about it is that the listing is very easy to follow. For example, to put the cursor at line 10, column 12, and print HELLO, you'd use the following line:

```
60 PRINT LN$(10); CL$(12); "HELLO"
```

This won't work until you set up the arrays, of course. To create the arrays LN$ and CL$ (for lines and columns), add this short subroutine to your program:

```
1 GOSUB 60000
59999 END
60000 F = 0: LS = F+24: CS = F+39
60010 DIM LN$(LS), CL$(CS)
60020 LN$(F) = CHR$(19)
60030 CL$(F) = " "
60040 FOR X = F+1 TO LS
60050 LN$(X) = LN$(X-1) + CHR$(17)
60060 NEXT
60070 FOR X = F+1 TO CS
60080 CL$(X) = CL$(X-1) + CHR$(29)
60090 NEXT
60100 RETURN
```

Now you can move the cursor anywhere on the screen by using the arrays LN$ and CL$. The 25 lines are numbered 0–24; the columns, 0–39. If you prefer not to start counting at zero, change the first part of line 60000 to F = 1 (the columns will now be numbered 1–40 and the rows 1–25).

To see this technique in action, type in the subroutine above and add these lines:

```
10 FOR X = 0 TO 14
20 PRINT LN$(X);CL$(X);"*"
30 NEXT
```

Untwist A Renumbered Program

Michael A. Lang

The RENUMBER command on the 128 is a delight, but using it makes it tough to find the new starting line number for subroutines and other sections of your program. This is my solution:

```
10 GOTO 100
20 GOSUB 1000: INITIALIZATION
30 GOSUB 2000: OPEN DATA FILE
40 GOSUB 3000: SORT ROUTINE
99 REM MAIN ROUTINE STARTS
   BELOW
100 ...
```

The GOTO in line 10 jumps right to line 100, which means lines 11–99 are never executed. But the 128 doesn't know that and modifies those lines when you renumber. After renumbering is finished, press F7 to list the program and then hit the NO SCROLL key to pause the listing. You'll see what amounts to a menu of subroutines and their starting line numbers.

If you have a renumbering utility for the 64, this trick will also work in 64 mode.

This is especially useful when it's been a few weeks since you last examined a program. The first few lines provide an overview of how the program is organized.

Commodore SERVICE

POWER SUPPLY (C-64)	29.95
1541 (Alignment)	35.00
C-64 (Repair)	44.95
C-128 (Repair)	95.00
1541 (Repair & Alignment)	75.00
1571 (Alignment)	40.00
1571 (Repair & Align)	135.00
POWER SUPPLY (C-128)	99.95
PARTS C-64 & C-128	CALL

PARTS AND DIAGNOSTICS INCLUDED
(**FREE** Return Freight in the USA.
APO-FPO, C3PO add $10)

TO SAVE C.O.D. CHARGES - SEND UNIT & POWER SUPPLY WITH CHECK OR M.O.

(916) 635-3725

Second Source Engineering

2664-B Mercantile Drive
Rancho Cordova,
CA 95670

MasterCard VISA

How to get a helping hand from your computer without spending an arm and a leg.

Planner's Choice. Planner's Choice will not only help the family budget. It can help plan your budget. Your stock portfolio. Your taxes, too.

Getting your computer to do a lot doesn't have to cost a lot. Not when you have Personal Choice Software. It's personal productivity software that takes on any assignment. Yet, it's every bit as affordable as it is efficient.

For example, if you want to refinance your home, Planner's Choice turns your home computer into a spreadsheet. Simply type in the numbers and calculate the effects of different interest rates by pressing a button. You won't have to take out a second mortgage for the privilege, either. Because Planner's Choice is priced to fit any budget plan.

Writer's Choice. Writing can be a moving experience with the cut and paste option. While the document preview lets you peek before you print.

If you're a writer, the value of Writer's Choice is clear from the start. It includes features that some more expensive word processing tools don't. Like a spelling checker and help screens. So your fingers can work the keyboard, not the manual.

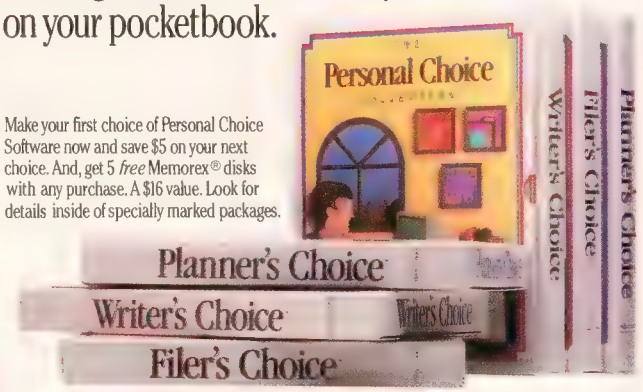
Or, you may wish to begin with Filer's Choice. It's a great place to record, store and sort information in just about whatever way you please.

What's more, if you prefer to do all your shopping at once, you can own The Personal Choice Collection for a lot less than you'd normally pay for a single spreadsheet, word processing, or filing program with similar capabilities.

Filer's Choice. It will sort information numerically, or alphabetically. Call up help screens. And take down reports.

They also work very well together. Which means that Personal Choice Software is the perfect choice. Especially when you want hard working software — that's easy on your pocketbook.

Make your first choice of Personal Choice Software now and save $5 on your next choice. And, get 5 *free* Memorex® disks with any purchase. A $16 value. Look for details inside of specially marked packages.



PERSONAL CHOICE SOFTWARE™

A lot of software for a lot less.

Available for Commodore 128 and 64, Apple II series, IBM PC, PCjr, Tandy 1000 and compatibles. Commodore 64 and 128 are trademarks of Commodore Electronics, Limited. IBM PC and PCjr are trademarks of International Business Machines Corporation. Tandy 1000 is a Trademark of Tandy Corporation. Apple II is a trademark of Apple Computer, Inc. Personal Choice Software is a trademark of Activision, Inc. Activision is the registered trademark of Activision, Inc. © 1986 Activision.

Bar Charter

Raymond Jacob

Get a new perspective on data generated by your applications program—graph it with this easy-to-use vertical bar chart routine for the 64.

About a year ago, my wife and I started keeping our banking records on disk using a program I wrote. Recently, my wife suggested that it would help if we could look back over a given two-month period and view our spending trends. Although the program we were using did a beautiful job of organizing and listing information on the screen, displaying spending trends was well beyond its abilities.

A file of running balances contains patterns that could be discovered more easily if the numbers were translated into a more visual form. Displaying the file as a vertical bar chart transforms numbers into visual peaks, valleys, and plateaus from which you can determine and assess trends. This makes the bar chart a popular tool in the business and scientific communities.

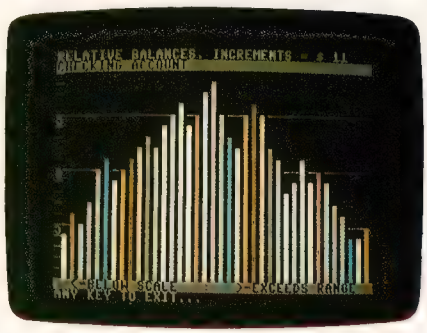
Charting Your Own Numbers

Your programs can use "Bar Charter" to help you identify patterns in your data. To use Bar Charter in your program, type in and save Bar Charter beginning at line 1000 (omit lines 100–160). Now you should write a program to call the Bar Charter subroutine. Have your program dimension array B( ) to the number of increments to plot (maximum of 38) and assign the values to be graphed to the elements of array B. Then GOSUB 1000 whenever you need to display a chart. When the routine is called, it turns the border and background color black.

An Example

As a demonstration of the routine, I've included a few program lines at the beginning of the listing to act as a main program from which the chart routine gets its data. Just type in the entire program and run it for a demonstration. Imagine that our main program is one that calculates and displays the running balances of a checking account based on a transaction file. For convenience' sake, our transaction file is encoded in the program as DATA statements (lines 120–160). Positive numbers are deposits; negative numbers are withdrawals.

In this example, the chart routine is being used to display 38 running balances as bars on a chart divided into 19 increments. Each increment represents the dollar amount—called the *increment value*—by which to measure and compare the lengths of the bars. Since our transaction file causes running balances to range between $40 and $200, the routine has to proportionately reduce each running balance to fit it within the confines of the chart before drawing the bar. The increment value divided into each running balance must return a number less than 20 in order for a bar to be drawn. Otherwise, a > is plotted to indicate overflow. Obviously, the increment value is dependent upon the size of the values to be graphed, so the routine prompts you to set the increment value each time the routine is called. This lets you select the viewing scale. Setting the right increment value means that all balances are displayed as bars using the smallest increment value possible. In our example, the best graph is made by setting the increment value to 11, but try other values to see what happens. Feel free to change the numbers in the DATA statements to see the effects.



Graphing your data with Bar Charter gives you a new perspective on numbers. This photo was generated by the demo program with an increment of 11.

This routine has made my home-budget program more useful by changing it from a mere record organizer into a bona fide analysis tool. It could do the same for your programs.

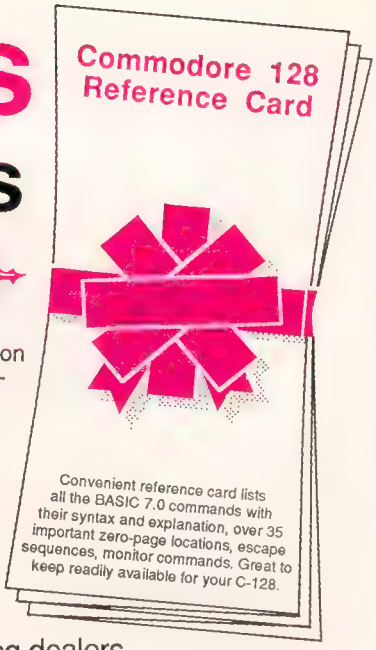
See program listing on page 140.

Begin your Holidays

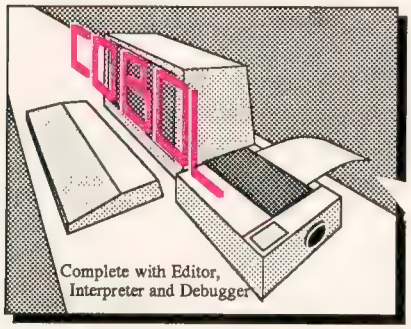
with a free gift* from Abacus

Super Pascal Compiler
Not just a compiler, but a complete system for developing applications in Pascal–with graphics. Extensive editor with search, replace, renumber, etc. Standard J & W compiler that generates machine code. High-speed disk access. 48K RAM is available. If you want to learn Pascal or to develop software using the best tools available–**Super Pascal** is your first choice. **C-64 $59.95**

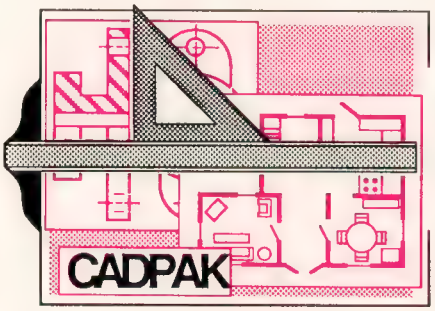
Simply fill out the attached coupon and return it to one of our participating dealers for your **free** Commodore 128™ Reference Card (Retail value $2.95). And while you're there, take a look at our complete line of top-notch software. No purchase necessary.


Commodore 128
Reference Card
Convenient reference card lists all the BASIC 7.0 commands with their syntax and explanation, over 35 important zero-page locations, escape sequences, monitor commands. Great to keep readily available for your C-128.

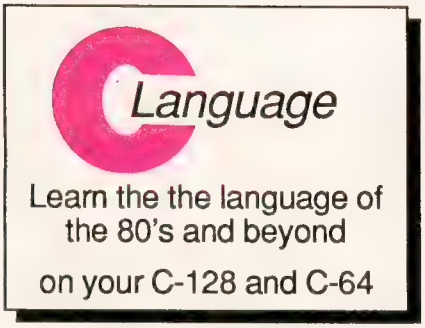
* Available at participating dealers



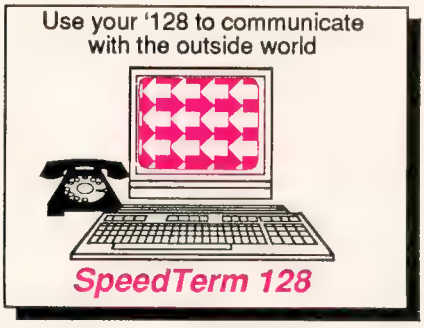
COBOL
Now you can learn COBOL, the most widely used commercial programming language, on your 128 or 64. COBOL Compiler package comes complete with syntax-checking editor, interpreter and symbolic debugging aids. New '128 version works with 40/80 column monitors and is quicker than the '64 version. **C-128 $59.95**
C-64 $39.95



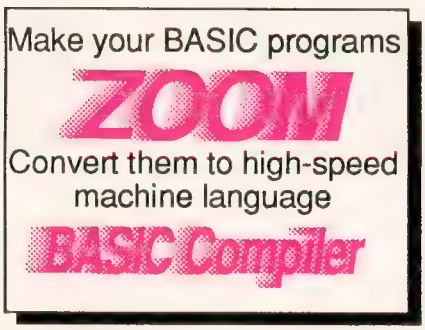
Cadpak
Easy-to-use interactive drawing package for accurate graphic designs. Dimensioning features to create exact scaled output to all major dot-matrix printers. Input via keyboard or lightpen. Two graphic screens for COPYing from one to the other. DRAW, BOX, ARC, ELLIPSE, etc. available. Define your own library of symbols/objects–store up to 104 separate objects. **C-128 $59.95**
C-64 $39.95



Super C Compiler
For school or software development. Learn the C language on the '64 or '128. Compiles into *fast* machine code. Added '128 features: CP/M-like operating system; 60K RAM disk. Combine M/L & C using CALL; 51K available for object code; Fast loading; Two standard I/O librarys plus math & graphic libraries. **C-128 $59.95**
C-64 $59.95



Speedterm-128
Let your C-128 communicate with the outside world. Obtain information from various computer networks. Flexible, command driven terminal software package. Supports most modems for the C-128. Xmodem and Punter file transfer protocol. VT52/100 terminal emulation with cursor keys, large 45K capture buffer & user definable function keys. **C-128 $39.95**



BASIC Compiler
Complete BASIC compiler and development package. Speed up your programs 5x to 35x. Compile to machine code, compact p-code or both. '128 version: 40 or 80 col. monitor output and FAST-mode operation. '128 version includes extensive 80-page programer's guide. A great package that no software library should be without. **C-128 $59.95**
C-64 $39.95

Other Products:

Personal Portfolio Manager	64 or 128	$39.95
Technical Analysis System	64 or 128	$59.95
PowerPlan spreadsheet	64	$39.95
Xref-BASIC cross reference	64 or 128	$17.95

Commodore 64 and Commodore 128 are trademarks of Commodore Ltd.

Call now for the name of your nearest dealer. To order direct call **616/241-5510**. Add $4.00 per order for S&H. Foreign add $10.00 per item. Call or write for your **free catalog** of software and books. Dealer inquires welcome. 1500 dealers nationwide.

Abacus

P.O. Box 7219 Dept GC Grand Rapids, MI 49510
Phone 616/241-5510 • Telex 709-101 • Fax 616/241-5021

GOOD FOR ONE COMMODORE 128 REFERENCE CARD

One per customer. Good only while supplies last. This offer ends January 31, 1987.

Name _____

Address _____

City _____ State _____ Zip _____

Have you ever purchased Abacus products before? _____

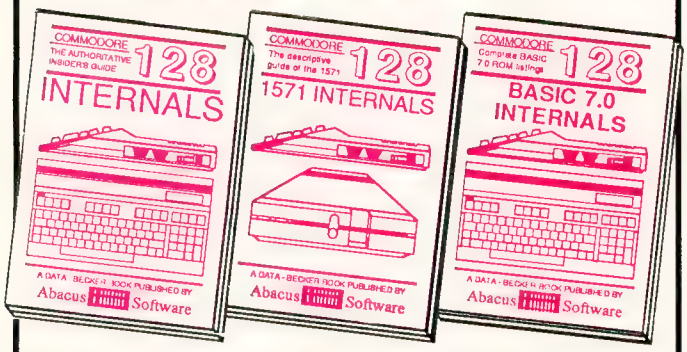
Dealer _____

GC

GOOD FOR ONE COMMODORE 128 REFERENCE CARD

BOOKS

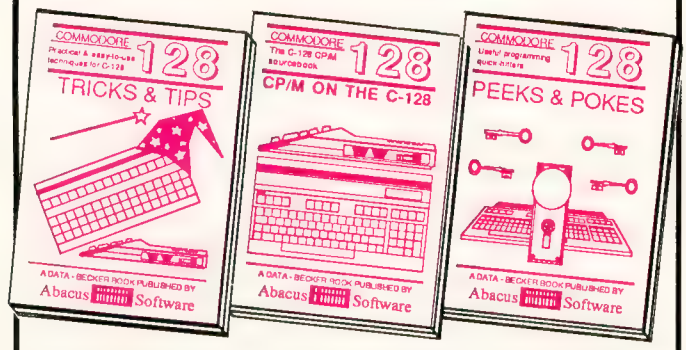
that stand on their own



C-128 INTERNALS
Detailed guide on the 128's operating system. Explains graphic chips, Memory Management Unit, input and output, 80 column graphics and fully-commented ROM listings, more. 500pp $19.95

1571 INTERNALS
Vital insiders' guide. Sequential, relative files, and direct access commands. Describes DOS routines. Discusses the various disk formats. Fully-commented ROM listings. 450pp $19.95

C-128 BASIC 7.0 Internals
Get all the inside information on BASIC 7.0. This exhaustive handbook is complete with fully commented BASIC 7.0 ROM listings, processor control, programs, more. $24.95



C-128 TRICKS & TIPS
Filled with fascinating and practical info on the C-128. Create multiple screens, 80 column hires graphics, learn bank switching. 300 pages of useful information for everyone. $19.95

C-128 CP/M User's Guide
Take a revealing look into CP/M on your 128. Essential guide with a simple explanation of the operating system, memory usage, CP/M utility programs, submit files. 300pp $19.95

C-128 PEEKS & POKES
Presents dozens of programming quick-hitters, fascinating and useful techniques on the operating system, stacks, zero page, pointers, the BASIC interpreter, and more. 240pp $16.95

C-128 BASIC Training Guide
Your essential introduction to programming in BASIC on your C-128. Chapter quizzes to test your knowledge on what your learning. Discusses problem analysis; descriptions of all BASIC commands with many examples; monitor commands; utilities; much more. $16.95

128/64 Computer Aided Design
Learn the fundamentals of CAD while developing your own system on the 128 or 64 with Simon's Basic. Create objects on-screen to dump to a printer. 3D techniques, mirroring and duplicating images, hatching. All the information you need to create a mini-CAD system. 300pp $19.95

Commodore 64 and Commodore 128 are trademarks of Commodore Ltd.

For the most complete series of C-128 or C-64 books available, call for the name of your nearest bookstore or dealer. Or order direct by calling 616/241-5510. Add $4.00 per order for S&H. Foreign add $10.00 per book. Call or write for your **free catalog** of books and software. Dealers inquires welcome. Over 1500 dealers nationwide.

Phone (616) 241-5510

Abacus

Telex 709-101 • Fax 616/241-5021
P.O. Box 7219 Dept. GC Grand Rapids, MI 49510

Sprite Graph

Chris Stoy

If you use graph paper rather than a sprite-designer program, this short program will prove handy. It prints out custom graphs for designing sprites. For the Commodore 64 with a Commodore or compatible printer.

Once a sprite has been designed, it's easy to manipulate. A simple BASIC loop can send your sprite flying across the screen. But designing a sprite well can be a chore. There are many sprite editors available, but if you don't have one handy, you must design your sprite on graph paper, or—worse yet—notebook paper. If you need to create a lot of sprites, this can be very time-consuming. "Sprite Graph," a short BASIC program that accompanies this article, prints out crisp, clean sprite graphs on your Commodore or compatible printer.

Printing The Graphs

Type in Sprite Graph using the Automatic Proofreader found elsewhere in this issue. When you've finished typing, save a copy to tape or disk. Before you run the program, be sure your printer is on and there's paper in it. (Printing with no paper in the printer can damage your printhead.) If you're using a printer interface, it may be necessary to adjust it to emulate Commodore printer commands.

After loading and running the program, you're asked how many graphs you want printed. Depending on your printer and the length of the paper, you can fit an average of three graphs per page. If you wish to stop printing a graph, press and hold the RUN/STOP–RESTORE keys. Don't be concerned if the printing doesn't stop immediately; whatever characters are still in the buffer (a holding zone) must finish printing out. You should avoid turning off the printer while it is printing.

If the program doesn't work on your printer, make sure the CHR$ codes used in the program are the same as those required by your printer.

See program listing on page 130.

THE REVOLUTIONARY NEW PRODUCT FOR DISK BACKUP COPYING!

DiskMaker PLUS

NEW!

THE C64/128 COPY SYSTEM *PLUS* PASSWORD COPY CODES *PLUS* UTILITIES!

Backup copying today needs to be an exact science. Our software engineers have met the challenge with a revolutionary NEW customized copy system! DiskMaker **PLUS**™ contains special password codes that unlock hundreds of different disks. DiskMaker **PLUS**™ provides you with a list of codes for 200+ individual software titles. No trial & error — just choose the title from the vast DiskMaker **PLUS**™ library and COPY! DiskMaker **PLUS**™ AUTOMATICALLY places the CORRECT password codes on the copy! DiskMaker **PLUS**™ copies software others can't! Copy with 2 drives in 40 sec! Copy with 1 drive in 2 min., using 1541, 1571, SX64, INDUS GT. **DiskMaker PLUS**™ **is only $39.95!!** Includes 1571 double sided copier for 128 disks & powerful NEW disk utilities:

- Automatic SUPER Password Code Kit
- Revolutionary NEW Disk Comparator
- Multipurpose Track & Sector Editor
- 40 Track Full Screen Disk Scanner
- 1 Drive 1541/1571 Data Copier
- 2 Drive 1541/1571 Data Copier
- 1 Drive 1541/1571 GCR Nibbler
- 2 Drive 1541/1571 GCR Nibbler

ToolKit

Available now! These are the tools we use to explore the disk realm. A Hackler's delight! Includes tutorial info. GCR Editor with data buffer, reads full tracks at one time. Edit in HEX, GCR, ASCII. Fast access Error Scanner allows easy disk research, creates & repairs errors. Relocatable monitor/disassembler with unimplemented opcodes and save to disk option. Multipurpose Formatter makes custom formats. Fat Track Kit emulates & creates Fat Tracks. Single/Double sided data copiers. Complete drive diagnostic package checks alignment, drive speed, head movement. Includes relocatable Super Fast Loaders you can save to your own disk! **All for only $39.95.**

To Order CALL 805-687-1541 ext. 64

VISA MasterCard AMERICAN EXPRESS

Ask for DiskMaker PLUS™ /ToolKit Combo Offer & DISCOUNT PLUS-PACK! Also available: 10PAK DSDD Premium Diskettes, DISKNOTCHER, DISKMINDER case holds 75 disks!

MasterKey™

NEW MODULE AVAILABLE NOW!

ATTENTION DiskMaker with MasterKey V3.3 owners: Call to get the NEW Module!

[illegible]

EXPAND YOUR SOFTWARE HORIZONS WITH DISKMAKER UTILITIES!

basix

3463 State Street · Suite 1541A · Santa Barbara · CA 93105

128 Quicksort

Alton C. Williams

Sort at lightning speed on the Commodore 128 with this machine language routine. It utilizes the fastest sorting method for most microcomputer applications.

Many programs need to sort data. Mailing lists, indexes, and databases are some of the most obvious examples. The most common sort routine—the bubble sort—is far too slow to be used for any but the smallest jobs. The next time you write a 128 application that requires a sort, use "Quicksort."

This program is written entirely in machine language for maximum speed. It sorts any array of strings. Each element of the array may be up to 80 characters long.

Typing It In

Because Quicksort (Program 1) is written entirely in machine language, it must be entered using the "128 MLX" machine language entry program found elsewhere in this issue. Be sure to read the instructions for using MLX before you begin entering data. When you run MLX, you'll be asked for a starting and an ending address for the data you'll be entering. The correct values for Quicksort are as follows:

Starting address: 1300
Ending address: 17D7

After you've entered all the data, be sure to save a copy before leaving MLX.

To use the Quicksort routine, you must first load the program with a statement of the form BLOAD "QUICKSORT" (substitute whatever filename you used when you saved the program). After dimensioning an array and filling it with data—an address list, for example—you're ready to use Quicksort. In addition to the SYS address, you must also supply the name of the array to be sorted, the number of items to sort, and the element within the array at which the sort is to begin. For example, if the variable N contains the number of items in the string array AA$(I) and the variable N1 contains the number of the element at which sorting is to begin, you would use the following statement:

```
SYS 4864,,,,,N,AA$(N1)
```

The five commas after the 4864 are necessary because of the 128's versatile SYS command. The commas bypass SYS parameters that Quicksort doesn't need. Of course, you don't have to use the same variable names I used, and numbers may be used instead of the variables N and N1.

After the SYS command is executed, the array items are sorted in ascending order starting with AA$(N1).

Quicksort sorts arrays containing thousands of items in a matter of seconds. But for maximum speed, use the FAST command before beginning the sort. If you're running your program in 40-column mode, the FAST command blanks the screen until the SLOW command is executed. FAST doesn't disable the 80-column screen. Here's an example of using FAST to speed things up:

```
FAST:SYS 4864,,,,,N,AA$(N1):SLOW
```

Program 2 provides a simple demonstration of Quicksort. Line 10 of Program 2 assumes that you stored the Quicksort machine language under the name SORT 128 .OBJ. If you used some other name when you saved the file with MLX, substitute the proper name in that line. Make sure a copy of the Quicksort file is on a disk in your drive when you run the program. This program shows the speed of the routine. Here are some typical sorting times:

10 strings	**.067 seconds**
100 strings	**.833 seconds**
1000 strings	**12.083 seconds**

Don't try to specify more than about 4000 elements for the array when using Program 2. If you do, you'll probably crash the program with an OUT OF MEMORY error message.

A Safety Test

Besides the area needed to store the machine language program ($1300–$17D1), this routine uses very little memory. The actual amount it needs depends on the number of elements it's sorting. It needs only about 120 bytes to sort an array of 1000 strings. The memory used is borrowed from the variable storage area while the sorting is done. Your BASIC program will never know that it was used. However, if your variables are using all of the nearly 64K of variable space (which is very unusual), then there may not be enough memory available to do the sort. Every time it executes, Quicksort sets a flag which your program may check to determine the success of the sort. After the SYS command is executed, you can check the value in memory location 250. If PEEK (250) is not equal to 0, there was insufficient memory, and the sort is invalid.

See program listings on page 139.

SILICON EXPRESS DISKS SS/DD 6.95 DS/DD 7.95
VERBATIM OR MAXELL SS/DD 13.95 DS/DD 16.95
ELEPHANT SS/DD 7.95 DS/DD 9.95
DATACASE 7.95
INSIDE OHIO 1-800-225-0755
OUTSIDE OHIO 1-800-228-0755
YOUR TOLL FREE ACCESS
CALL...FOR THE BEST PRICES...
BEST DELIVERY...
We have hundreds of other programs in stock at Fantastic savings.
SILICON EXPRESS
LASER 128—APPLE COMPATIBLE COMPUTER $395.95

Acrojet	22.45
Adventure Construction	27.95
Air Rescue I	24.95
Alcazar	20.95
Alien Addition	23.95
Alligator Mix	23.95
Alphabet Circus	20.95
Alphabet Zoo	14.95
Alter Ego (Female)	34.95
Alter Ego (Male	34.95
American Challenge	20.95
Archon	12.95
Archon II	24.95
Bard's Tale	27.50
Ballblazer	23.49
Back to Basics	134.95
Ballyhoo	27.95
Bank Street Storybook	27.95
Bank Street Filer	34.95
Bank Street Mailer	34.95
Bank Street Writer	34.95
Basic Toolkit	29.95
Battlefront	27.95
Blazing Paddles	24.95
Bop 'n Wrestle	20.95
Boppies Word Chase	20.95
Borrowed Time	20.95
Boston Computer Diet	34.95
Build a Book	17.95
Bumble Games	27.95
Bumble Plot	27.95
Carmen Sandiego	22.45
Carriers at War	34.95
Chmpshp Load Runner	17.95
Chem Lab	27.95
Chestmaster 2000	27.95
Clip Art (vol 1)	15.95
Clip Art (vol 2)	21.95
Colossus IV	24.95
Color Me	20.95
Compuserve Starter	21.95
Conflict in Vietnam	27.95
Copy 64	18.50
Countdown to Shutdown	20.95
Create with Garfield	20.95
Crimson Crown	12.95
Crossword Magic	30.00
Crusade in Europe	22.95
Cut & Paste	12.95
Cutthroats	23.69
Deadline	28.00
Demolition Division	23.95
Designer's Pencil	20.95
Donald Duck's Playgr.	17.95
Dragon Mix	23.95
Early Games	15.95
Easy as ABC's	20.95
Elite	20.95
Enchanter	20.95
Europe Ablaze	30.50
F-15 Stricke Eagle	20.00
Facemaker	14.95
Family Roots	149.95
Fairlight	20.95
Financial Cookbook	34.95
Flight Simulator II	30.50
Fraction Factory	15.95
Freddys Puzzling Adven.	20.95
Fast Tracks	20.95
Football	27.95
Gamemaker	27.95
Gato	19.95
Gertrude's Puzzles	20.95
Gertrude's Secrets	20.95
Ghost Busters	22.00
G I Joe	19.95
Gr American Road Race	20.95
Golden Oldies	20.95
Hacker	20.95
Hacker II	29.95
Haley Project	49.95
Hart of Africa	12.95
Hey Diddle Diddle	14.95
Hitchhiker's Guide	21.75
Homework Help: Math	22 95
Homework Help: Writing	22.95
Hot Wheels	20.95
Infidel	26.00
Infiltrator	20.95
Impossible Mission	35.00
Jet	27.95
Jet Combat Simulator	20.95
Juggle's Rainbow	20.95
Karateka	19.45
Kennedy Approach	24.95
Keys to Typing	17.95
Kids on Keys	14.95
Kid Writer	18.95
Kindercomp	14.95
Koronis Rift	23.49
Kung Fu	20.95
Kung Fu #2	20.95
Leader Board	27.95
Little Comp People	24.95
Load Runner	19.45
Lords of Conquest	24.95
Luscher Profile	20.95
Mail Order Monsters	12.95
Magic Spells	20.75
Mask Parade	27.95
Master of the Lamps	20.95
Mastertype	23.25
Math Blaster	26.95
Merlin 64	34.95
Meteor Multiplication	23.95
Mickey's Sp. Adv.	17.95
Micro League Baseball	22.50
Micro League Manager	27.95
Micro League Team Disk	13.95
Mig Alley Ace	24.95
Mind Forever Voyaging	30.95
Mind Mirror	24.95
Mind Prober	20.95
Mindshadow	20.95
Minus Mission	23.95
Most Amazing Thing	18.95
Moptown Hotel	27.95
Moptown Parade	27.95
Movie Maker	24.95
Movie Monsters	27.95
Multiplan	43.95
Murder on Mississippi	24.95
Music Construction	12.95
Music Studio	24.95
Nato Commander	19.75
Newsroom	30.50
Number Farm	20.95
One-On-One	12.95
Ogre	27.95
Paper Clip	41.95
Paper Clip W/Spellpak	55.95
Perfect Score	48.95
PFS: File	34.95
Piece of Cake Math	24.95
Pinball Construction	12.95
Pitfall II	20.95
Pitstop II	23.50
Planetfall	22.00
Print Shop	26.69
Print Shop Companion	21.95
Pr. Shop Gr 1, 2, or 3	13.95
Print Shop Refill	12.25
Puzzle Master	34.95
Quest	12.95
Rainbow Painter	24.95
Rhymes and Riddles	14.95
Oo-Topos	12.95
Sargon III	27.20
SAT (Harcourt)	55.95
Shapes & Color Rodeo	20.95
Sideways	20.95
Snooper Troops I	18.95
Snooper Troops II	18.95
Sorcerer	26.00
Solo Flight	19.95
Speed Reader II	36.95
Spell It	26.95
Spell of Destruction	20.95
Spitfire Ace	20.95
Spreadsheet	34.95
Spy Hunter	26.00
Spy vs. Spy	20.95
Starcross	28.00
Star Trek	25.75
Stick Bear ABC	20.95
Numbers	20.95
Math	20.95
Opposites	20.95
Reading	20.95
Shapes	20.95
Stickers	24.95
Summer Games I or II	22.45
Super Boulder Dash	12.95
Suspect	26.00
Suspended	28.00
Swiftcalc C64	34.95
Swiftcalc C128	41.95
Sword of Kadash	12.95
Sylvia Porter C64	34.95
Sylvia Porter C128	41.95
Tapper	20.95
Temple of Apshai Tril	22.45
Timeworks	69.95
Touchdown Football	12.95
Toy Shop	41.95
Tracer Sanction	20.95
Trains	18.95
Transylvania	12.95
Type!	27.95
Typing Tutor III	28.50
Ultima III	34.95
Ultima IV	41.95
Ultimate Wizard	20.95
Verb Viper	23.95
Will Writer	28.45
Winnie the Pooh	17.95
Winter Games	21.45
Wishbringer	27.95
Witness	22.00
Whole Brain Spelling	20.95
Word Attack	26.95
Word Invasion	23.95
Word Man	23.95
Word Master	23.95
Word Radar	23.95
Word Spinner	20.50
World's Grtest Baseball	19.45
World's Grtest Football	22.45
Writing Adventure	41.95
Xyphus	12.95
Zork I	21.75
Zork II	24.75

AMIGA

Aegis Animator	97.95
Draw	139.95
Aegis Images	55.95
Adventure Construction	27.95
Analyze	69.95
Archon	22.00
Archon II Adept	27.95
Arctic Fox	27.95
Art Pack #1	41.95
BBS-PC!	69.95
Borrowed Time	31.95
Chestmaster 2000	31.95
DeluxePaint	69.95
DeluxePaint #1	20.95
DeluxePaint #2	20.95
DeluxeVideo	69.95
Financial Cookbook	34.95
Golden Oldies	24.95
Hacker	31.95
Haley Project	31.95
Impact	139.95
Instant Music	34.95
Keyboard Cadet	27.95
Leader Board	27.95
Little Computer People	34.95
Marble Madness	34.95
Matertype	27.95
MaxiComm	34.95
MaxiDesk	49.95
MaxiPlan	69.95
Mean 18	34.95
Mindshadow	31.95
Music Studio	41.95
One-on-One	27.95
OnLine	48.95
Racter	31.95
Rogue	39.95
Scribble!	69.95
Seven Cities of Gold	27.95
Silent Service	27.95
Skyfox	27.95
Temple Apshai	27.95
Trinity	27.95
VIP Professional	139.95
Winter Games	39.95

HARDWARE

Datacase	7.95
Disk Notcher	4.95
Flip-n-File	10.95
Lemon	27.95
Lime	41.95
Grappler CD	79.95
Samsung Color Monitor	169.95

PRINTERS

Star LV 1210	199.95
Star KX-10	269.95
Star Powertype	344.95
Printer Stand	16.95
Color Ribbons	CALL

YOUR ORDER FORM
SILICON EXPRESS
5955 E. Main Street Columbus, Ohio 43213

NAME _____

ADDRESS _____

CITY ___ STATE ___ ZIP ___

CHARGE CARD # ___ Exp. Date ___

QTY	DESCRIPTION	PRICE

Computer Type _____ SHIPPING

Phone No. TOTAL

No additional surcharge on Mastercard Visa or School purchase orders Personal checks allow 2 weeks Shipping charges are $3 00 minimum Ohio residents add 5½% state sales tax Prices subject to change without notice

SILICON EXPRESS
5955 E. Main St. Columbus, Ohio 43213
1-614-868-6868

Mastering 128 Sound And Music

Part 3

D. C. Holmes

In this installment, the author demonstrates how to modify sound on the 128 by using the ENVELOPE statement. Two programs are included.

The frequency of a sound wave is the property which determines its pitch. What we hear as a high-frequency sound we call a high note and a low-frequency sound a low note. The ear is sensitive to other characteristics as well, and can distinguish between different instruments playing the same pitch. All of us, for example, can tell the difference between middle C struck on the piano and middle C bowed on the violin.

The peculiar properties of a sound which enable us to make this differentiation include its *timbre* (waveform) and amplitude qualities (ADSR—Attack, Decay, Sustain, and Release). Through manipulation of 11 variables related to waveform and ADSR, a seemingly infinite number (actually about 70 trillion) of individual voice registrations are possible on the 128. Professional synthesizer players refer to each of these combinations as a *patch*. Control of these variables in BASIC 7.0 is achieved using the ENVELOPE and FILTER statements.

The amplitude variations throughout the duration of a sound are described by the ADSR values. *Attack* is the rate at which the volume rises to its peak. The volume then decreases to a plateau (*sustain*). The rate at which this decrease occurs is the *decay* rate. The amplitude decreases again from the sustain level down to zero volume. The rate of this final decay is the *release* rate.

The timbre of a sound is determined by its waveform. The 128 can produce four types of waveforms (triangle, sawtooth, square, and noise). Waveforms can be modified with the FILTER statement.

The format for the ENVELOPE statement is:

ENVELOPE *n,a,d,s,r,wf,pw*

where:

n = envelope (0–9)
a = attack (0–15)
d = decay (0–15)
s = sustain (0–15)
r = release (0–15)
wf = waveform (0 = triangle, 1 = sawtooth, 2 = pulse, 3 = noise, 4 = ring modulation)
pw = width for pulse waveform (0–4095)

These parameters are initialized to the following values in the 128's ten default envelopes:

If you're unfamiliar with the sounds of the default envelopes, you may want to run "The Magic Flute," a demonstration program from Part 1 of this series. It gives a sampling of the 128's preset envelopes. Once you can distinguish the differences between these sounds, the effects of changing the various parameters are more easily understood.

Parameter Values

Here's an explanation of the ENVELOPE parameters:

a (attack, 0–15) is the rate at which a note reaches its peak volume. Note that the value of *a* is initialized to zero in the piano, calliope, drum, guitar, harpsichord, organ, and xylophone. The attack is instantaneous for these sounds, creating a percussive effect. For the preset accordion, flute, and trumpet envelopes, the attack is gradual; the notes sneak in gently. As the value of *a* increases, the attack becomes softer.

d (decay, 0–15) describes the rate at which the volume of a sound de-

	n	a	d	s	r	wf	pw	envelope name
ENVELOPE	0,	0,	9,	0,	0,	2,	1536	piano
ENVELOPE	1,	12,	0,	12,	0,	1		accordion
ENVELOPE	2,	0,	0,	15,	0,	0		calliope
ENVELOPE	3,	0,	5,	5,	0,	3		drum
ENVELOPE	4,	9,	4,	4,	0,	0		flute
ENVELOPE	5,	0,	9,	2,	1,	1		guitar
ENVELOPE	6,	0,	9,	0,	0,	2,	512	harpsichord
ENVELOPE	7,	0,	9,	9,	0,	2,	2048	organ
ENVELOPE	8,	8,	9,	4,	1,	2,	512	trumpet
ENVELOPE	9,	0,	9,	0,	0,	0		xylophone

creases from its peak level to its sustain level. Note that the value of *d* is initialized to zero in the accordion and calliope. Notes played in these envelopes maintain peak volume throughout the plateau, or sustain, phase. The rest of the preset envelopes decay at various rates to their sustain level.

s (sustain, 0–15) is the volume level a note holds from the end of the decay phase until the beginning of the release phase. In the cases where the value of *s* is 0 (piano, harpsichord, and xylophone), the volume decays completely to a zero volume level. Notes played in these envelopes have a staccato quality (staccato is a musical term indicating a series of notes in which each note is discontinued abruptly before the next note is heard), and a whole note sounds the same as a quarter note followed by a dotted half rest. When *s* is 15, as in the preset calliope envelope, the sustain volume is the same as the peak volume in the attack phase; there is no decay phase. Whenever *s* is 15, *d* must be 0, or unexpected cyclical decay-sustain effects will result.

r (release rate, 0–15) is the last phase in the duration of a note, and it follows the sustain phase. The value of *r* determines the rate at which the volume drops from the sustain level to zero volume. Note that *r* is preset to either 0 or 1 in all of the default envelopes. This means that the release occurs rather rapidly, and there is a good reason always to set *r* to a low value in musical programs. If a note is followed by another specified for the same voice, the SID chip will turn off the first note and switch to the next at the specified moment. If, however, a note is not followed by another, the SID turns off the last note according to the value of *r* for its specific envelope. For example, when *r* is set at 15, the final whole note in a piece may linger for a surprisingly long time.

wf (waveform) determines the timbre of the musical sounds produced by the 128. The SID chip is capable of generating sounds of four waveforms: *triangle* (wf = 0), *sawtooth* (wf = 1), *pulse* (wf = 2), and *noise* (wf = 3). The triangle waveform sounds warm and muted (calliope, flute, xylophone). The sawtooth waveform sounds bright (accordion, guitar) and is generally louder than the triangle. The sound of the pulse waveform is variable according to the pulse width (*pw*) specified. The noise waveform generates a nonpitched sort of sound which can be used to mimic drums, cymbals, and other percussion instruments. If *wf* is set to 4, a triangle wave is activated which is *ring-modulated* between voices. This is an interesting effect, but for now it will produce unwanted results if it's used in place of the other values of *wf* in our programs.

pw (pulse width, 0–4095) is specified only when the pulse waveform (*wf* = 2) is selected. This parameter designates the duration of each pulse, and a variety of harmonic effects can be produced (*pw* = 512 for harpsichord and trumpet; *pw* = 1536 for piano; *pw* = 2048 for organ).

This month's first program, "Custom Envelope," gives you an opportunity to adjust the ENVELOPE parameters and hear the result. Enter values for *a, d, s, r, wf* (and *pw* if *wf* = 2), and select a default (preset) envelope for comparison. The 128 plays an ascending C scale using the preset envelope, followed by a descending scale using your custom envelope. Then you can choose to play it again, select a different preset envelope for comparison, or change the parameters of your custom envelope. This should help to acquaint you with the ADSR and waveform elements of sound quality.

A Piano Is A Piano Is A...

Before the piano was invented, there was the harpsichord. It's a wonderful sounding instrument, but it has just one sound. Hit a key hard or touch it lightly—it sounds the same. Release a key quickly or hold it down—no difference. It has the same ADSR every time. That's why there was so much excitement when the piano was introduced. It's touch-sensitive, and all aspects of ADSR are within the control of a skilled player. The name *pianoforte* was coined for this instrument because you could play dynamic levels ranging from soft (piano) to loud (forte) and anything in-between. The name, of course, has been shortened to *piano* over the years.

The 128's preset piano envelope (T0) plays with a percussive attack, and a complete decay with no sustain. This is appropriate for staccato phrases, but legato and sustained parts aren't rendered true to the manuscript. In fact, the whole notes decay as rapidly as the quarter notes.

For this month's second program, "VF16," I've selected a Prokofiev composition for piano which features both staccato and legato passages. I specify the custom envelope in line 20:

```
20 ENVELOPE 0,0,9,2,1,2,1536
```

This is essentially the preset piano envelope, with the sustain level raised to 2 and the release rate changed to 1. These changes allow you to hold the long notes for their full value. Try entering one of your custom envelopes in line 20 and see how this sounds on your "instrument."

This Prokofiev piece, "Vision Fugitive XVI," has an eerie feel—although you'll notice that your 128 doesn't really sound much like a piano. We can make some unusual and entertaining sounds on the 128, but we'll never mistake it for a piano. If it's any consolation, remember that Horowitz can't use his Steinway to run a spreadsheet or vaporize aliens.

See program listings on page 142.

All programs listed in this magazine are available on the GAZETTE Disk. See elsewhere in this issue for details.

Partner 128

Partner 128, a cartridge-based desktop-accessories program from Timeworks, performs as advertised: the Commodore 128 equivalent of Borland's popular *Sidekick* desk-accessories product for IBM and Macintosh computers. And as the base of 128 productivity software grows, *Partner 128* may well become the most valuable utility you can have.

Residing in a ROM cartridge, *Partner 128* doesn't consume your computer's memory as do disk-based utilities, and yet it's always there, always ready, as you'd expect a partner to be.

Then, at the touch of a button, *Partner* will freeze the program with which you're working and present you with a bright, yellow-on-black menu that offers you a choice of Calendar, Calculator, Memo Pad, Screen Printer, DOS Shell, and more. Further, because it truly supports the use of two disk drives, there need be no disk swapping in order to call up information stored with *Partner*.

Partner 128 must be installed before turning on your computer and disk drive. This involves putting the cartridge into the game port of your 128 and plugging the attached cord into joystick port 2. (Because of this, *Partner* will not work with programs requiring their own cartridge. For programs that may require a dongle in port 2, Timeworks makes available a Y cable.) It's also necessary to have the program with which you're going to work in the disk drive and ready to be booted: *Partner* works only as a background to a disk-based program.

As you turn on your computer, there will be a very brief flash of *Partner*'s title screen, simply to tell you it's there and ready. Then it retires to its waiting place, and the autoboot sequence begins. Your program runs. To call up *Partner*, simply press the large white button on the cartridge.

Now the *Partner* menu appears, offering you eight categories of choices. Although it's last on the list, Choice 8—Setup—is probably the most important, for it allows you to set control codes for your printer, disk drive or drives, and modem. These settings can then be saved to disk (if different from the default settings) and thus loaded quickly during subsequent uses of *Partner*.

If you're using two disk drives, you can also set which drive will be used by *Partner*. In my case, my second 1571 drive is set as device 9. Whatever I do with my word processor will be saved to and loaded from drive 1 (device 8), but whatever I do with *Partner* will be saved to and loaded from drive 2. In this way, I can keep my formatted *Partner* disk in the second drive, and it's as unobtrusive as *Partner* itself is.

To take the other utilities in the order in which they appear on the menu, the first is Appointment Calendar/Date Book. Select it, and a calendar for January 1986 appears. The + key will increment the calendar one month at a time; the TAB key, six months at a time. The − and SHIFT–TAB keys will reverse the process. You can go up to December 1999.

Select a date with the cursor keys, press RETURN, and the screen flips to show you a Daily Detail display. Now you have a Title box, a place to list Key Tasks, a To Do list, and a place to schedule appointments. Once these have been filled in, save the information on a formatted disk and press the ESC key to return to the calendar. You'll notice that your title now appears in the date box, serving as a flag that will always be there when you load data for that month.

The Memo Pad is a mini–word processor with word-wrap, line insert and delete, and text formatting. Memos can be saved and printed, and a suggestion in the manual reminds you that you can use the Memo Pad to create your own help screens for various programs. There is also a Typewriter mode that may be selected. In using it, press RETURN after each line, and the line is sent directly to your printer.

COPY II 64/128™

BACKUP PROTECTED SOFTWARE FAST.

From the team who brought you COPY II PLUS (Apple), Copy II PC (IBM) and COPY II MAC (Macintosh) comes a revolutionary new copy program for the Commodore 64 and 128 computers.

- Copies many protected programs—automatically. (We update Copy II 64/128 regularly to handle new protections; you as a registered owner may update at any time for $15 plus $3 s/h.)
- Copies even protected disks in under 2 minutes (single drive).
- Copies even protected disks in under 1 minute (dual drive).
- Maximum of four disk swaps on a single drive.
- Includes fast loader, 12-second format.

Requires a Commodore 64 or 128 computer with one or two 1541 or 1571 drives.

Call 503/244-5782, M–F, 8–5 (West Coast time) with your VISA in hand. Or send a check for $39.95 U.S. plus $3 s/h, $8 overseas.

$39.95

Central Point Software, Inc.
9700 S.W. Capitol Hwy. #100
Portland, OR 97219

Central Point Software INCORPORATED

Backup utilities also available for the IBM, Apple II, Macintosh and Atari ST.
This product is provided for the purpose of enabling you to make archival copies only.

Next is the Address/Phone List. From the information saved here, you may print mailing labels and envelopes, or use the Auto Dial feature to call a friend via modem.

The Calculator presents you with an onscreen graphic representation of a hand-held calculator. Keypad or regular numbers may be used for entry, and the standard math operators (+, −, *, /, =) are used. If you wish, you may also print out a "paper tape" of your calculations.

Screen Printer takes your program, at the point where it was frozen by activating *Partner*, and dumps it to the printer. Though this is a screen dump, it's for text only, not graphics. This is not a handicap because, strictly speaking, there should be no graphics in 80-column mode.

SwiftDOS allows you to format disks, rename or erase data files, and initialize or validate a disk. In being able to do this without having to leave your main program for more than a few minutes, *Partner* is providing what is, in effect, a DOS shell. And SwiftLock gives you the option of setting up a code that puts your program on hold, allowing no keyboard entry until the code is reentered. This might be nice if your children swoop down on your computer every time you walk away from it.

We did our testing of *Partner* with three programs from Activision's Personal Choice line of software: *Writer's Choice*, *Filer's Choice*, and *Planner's Choice*, and experienced no problems. Undoubtedly, *Partner 128* will also work well with Timeworks' own 128 series of productivity software.

A personal tip: Some time ago I obtained a right-angle attachment for the game port of my 128. It's called 'LBO and is from a company named Marjac. In using *Partner 128*, I find this to be an ideal accessory, for the cartridge sits in a vertical position, and the activating button is easier to reach. Whether or not you use this method, *Partner* can stay in the game port, being disabled by removing the plug from the joystick port. This will allow you to free your 128 for 64 or CP/M applications, yet always have *Partner* close at hand.

The documentation is excellent, leading you step-by-step through the uses of each utility. Though you can create your own machine-language utilities for loading into *Partner*, the instructions carry only a message that this can be done. Registered owners of *Partner* may apply to Timeworks—in writing only—for further information and a utility disk. For everyday applications, if the documentation doesn't answer your questions, Timeworks will, through a toll-free help line.

In summary, we found *Partner 128* to be a valuable addition to the productivity applications of the 128, working as advertised and filling a real need. As a result, we feel Timeworks has another winner, and deservedly so.

(A Commodore 64 version of *Partner* should also be available by the time you read this.)

—Ervin Bobo

Timeworks
444 Lake Cook Rd.
Deerfield, IL 60015
$69.95

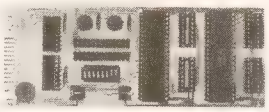
Mystery! And *Castles And Creatures*

When I was in high school, almost weekly my English teachers used to say, "The best way to learn to write is to do it. WRITE." And since they were the bosses, we did as they said. Yet, that sounds so intimidating now. "Write." How do I do that? you say. Where do I begin?

If you feel the same way, you're not alone. Many people who would like to write for either business or pleasure are intimidated by the idea of sitting down in front of a blank piece of paper.

THE ULTIMATE CONTROL INTERFACE

Compatible with C64, C128 in 64 & 128 modes, and C128 in CP/M mode



Universally applicable dual 6522 Versatile Interface Adapter (VIA) board. Intelligently control almost any device. Perform automated testing. Acquire data for laboratory and instrumentation applications. Provides four 8-bit fully bidirectional I/O ports & eight handshake lines. Four 16-bit timer/counters. Full IRQ interrupt capability. Expandable. Includes extensive documentation and programs on disk. $169 postpaid USA. Each additional board $149.

***SYMBOL MASTER** MULTI-PASS SYMBOLIC DISASSEMBLER*

The original and best is now even better with Version 2.0! Disassembles any 6502/6510/undoc/65C02/8502 machine code program into beautiful source. Includes both C64 & C128 native mode versions. Learn to program like the experts! Adapt existing programs to your needs! Outputs source code files to disk fully compatible with your MAE, PAL, CBM, Develop-64, LADS, Merlin or Panther assembler, ready for re-assembly and editing. 100% machine code and extremely fast. 63-page manual. Advanced and sophisticated features far too numerous to detail here. $49.95 postpaid USA.

PROFESSIONAL UTILITIES & RESOURCES

- C64 Source Code. Most complete available reconstructed, extensively commented and cross-referenced assembly language source code for Basic and Kernal ROMs, all 16K. In book form, 242 pages. $29.95 postpaid USA.
- PTD-6510 Symbolic Debugger for C64. An extremely powerful tool with capabilities far beyond a machine-language monitor. 100-page manual. $49.95 postpaid USA.
- MAE64 version 5.0. Fully professional 6502/65C02 macro editor/assembler. 80-page manual. $29.95 postpaid USA.

SCHNEDLER SYSTEMS

1501 N. Ivanhoe, Dept. G12, Arlington, VA 22205
Information/Telephone Orders (703) 237-4796. VISA/MasterCard

PROJECT: SPACE STATION

HesWare

P.O. Box 631-SCS, So. San Francisco, CA 94080
(415) 871-0570

Your Immediate Objective:
Send us your best *Project: Space Station* Program.

Your *Ultimate* Objective:
Win a scholarship to U.S. Space Camp.

Commander Puhassis is one of a dozen fictional characters you might incorporate in your PROJECT: SPACE STATION program. But there's nothing fictional about the U.S. SPACE CAMP in Huntsville, Ala. If your completed PROJECT: SPACE STATION program is judged among the best submitted to HesWare, you win a scholarship for a week of space assignments.

See your software dealer for SPACE CAMP scholarship guidelines, or write direct to the address above.

Woodbury Software has introduced the PlayWriter series, a line of new writing programs that entertain you as well as give you practice writing. This series, which includes the two packages reviewed here—*Mystery!* and *Castles and Creatures*—leads you step by step in creating a short murder mystery or medieval fantasy. With the materials provided, you can print your story on special paper, illustrate it with stickers and pictures, and bind it into a full-color hard cover. Presto! You've produced your first book.

Actually, as PlayWriter's manual wisely advises, you're able to write several stories with each program. These can be saved to disk and/or printed out on regular printer paper. You can then choose your favorite to publish.

PlayWriter's technique is to guide you by asking questions. In some cases it offers you choices such as: "The hero of your story is a brilliant young detective. Do you want this detective to be a: (1) she? (2) he?" Other times it asks you to provide a few sentences to fulfill a certain purpose, say, describing the magic artifact missing from the castle. Occasionally, PlayWriter will offer to do the writing for you. Through it all, the program interacts with you. It calls you by name, asks you your most often-used expression, and inquires about your favorite dessert. Since there is a bit of a wait when loading segments, PlayWriter asks you riddles to pass the time.

You edit your story chapter by chapter in a word processor mode. You may do this as you write or after the whole story is finished. When you're through, you may print it onto printer paper or, if you're ready, on the booklet paper provided. If you don't have a printer, Woodbury will print your story on PlayWriter paper for a fee. Refill packs are available so that you may make more than one book.

PlayWriter's manual is one of the best short manuals I've ever seen. It's full of helpful hints and advice such as telling you exactly how many stories will fit on the master disk or on a disk dedicated only to stories. It provides clear examples of what you'll encounter in the program, including a list of the editing commands, their purposes and keystrokes. It anticipates questions and problems you may have and speaks to them clearly and succinctly. It illustrates how to put the book together. There is also a Trouble Shooting section. The solution that most endeared this manual to me was for the problem of master disk errors: Call Woodbury. That kind of technical support is much appreciated.

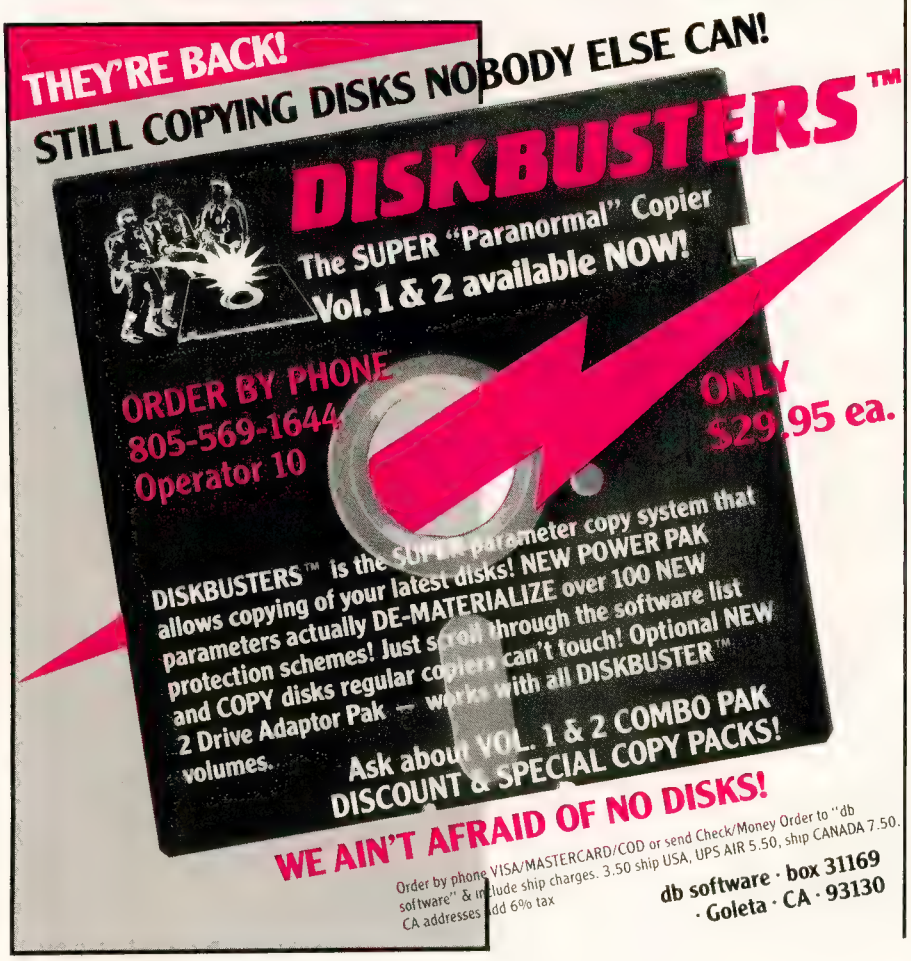
The printing selections include just about every possibility you could desire, from printing to your screen to printing on plain paper to printing on the booklet paper. It even offers the option of telling you if a paragraph is too long for booklet printing.

Mystery! and *Castles and Creatures* sometimes seem slow, even with an assist from aids like *FastLoad*. It takes time for these programs to move around all the text they have to handle. The word processor, especially the editor, is cumbersome. Having worked with regular word processing programs, it took a while to get used to this one. And switching disks when your story is not on the master disk can be awkward. A warning on switching disks: Some stories can be saved on the master disk. "Change story disk" *must be selected* before any other command when your story is on another disk; otherwise, you'll find yourself working on—or worse, *deleting*—the wrong story. The manual mentions this, but a reminder in the menu would be a big help. Only full stories can be deleted, not chapters. If you don't like what you've written, you have to start over.

Back to our English teachers' directive: "Write." Of what use are programs like *Mystery!* and *Castles and Creatures*? They provide a guide, an outline that coaxes you into writing. This outline draws parameters that limit you in length and content, yet leave you enough creative freedom to write your own story. *You* determine how much the computer does or does not do. In editing, you can rewrite entire chapters if you wish. Writing within limitations can be good discipline. Perfecting your ability to do that will help make you a good writer. For those who are so intimidated by the idea of writing they can't think of ideas and thus never start, the PlayWriter series is a beginning, a door-opener. Whatever your age, whatever the reason you wish to develop your writing skills, or even if you just want to have fun, *Mystery!* and *Castles and Creatures* provide delightful writing practice.

—*Robin Minnick*

Woodbury Software
127 White Oak Lane
Old Bridge, NJ 08857
$39.95 each


THEY'RE BACK!
STILL COPYING DISKS NOBODY ELSE CAN!
DISKBUSTERS™
The SUPER "Paranormal" Copier
Vol. 1 & 2 available NOW!
ORDER BY PHONE
805-569-1644
Operator 10
ONLY
$29.95 ea.
DISKBUSTERS™ is the SUPER parameter copy system that allows copying of your latest disks! NEW POWER PAK parameters actually DE-MATERIALIZE over 100 NEW protection schemes! Just scroll through the software list and COPY disks regular copiers can't touch! Optional NEW 2 Drive Adaptor Pak — works with all DISKBUSTER™ volumes.
Ask about VOL. 1 & 2 COMBO PAK DISCOUNT & SPECIAL COPY PACKS!
WE AIN'T AFRAID OF NO DISKS!
Order by phone VISA/MASTERCARD/COD or send Check/Money Order to "db software" & include ship charges. 3.50 ship USA, UPS AIR 5.50, ship CANADA 7.50. CA addresses add 6% tax
db software · box 31169 · Goleta · CA · 93130

Fontmaster II

As one of my friends likes to say, "A computer is a solution in search of a problem." In fact, many problems are conceived to be so difficult that we fail to consider how the prodigious power of the computer can be used to solve them. The problem of publishing attractive letterheads and manuscripts, previously solved by leaving large sums of money with the typesetter, can

be accomplished single-handedly with Apple's Macintosh and LaserWriter, currently selling together for slightly less than the average family station wagon. In other words, still too much for many of us to afford.

Fortunately, Xetec's *Fontmaster II*, an integrated word processing and printer utility program for the Commodore 64, can make do-it-yourself desktop publishing possible without totally draining the family's resources. Given some practice, a Commodore user can print very attractive letters, term papers, business forms, or any other type of document in any of the 33 different fonts (lettering styles) with this technically elegant program, including the Russian, Greek, and Hebrew alphabets, scientific symbols, and 29 Roman alphabets.

By using the included Font Creator program, other alphabets, such as Arabic, Devanagari, Cherokee, or Thai, can be created. By using the Character Set Creator program, they can be displayed on the screen, either left-to-right or right-to-left. The printout can even combine two languages written in opposite directions. Finally, since *Fontmaster II* allows the user to print a dot or any combination of dots from a dot-matrix printer in any conceivably useful location, up to nine different fonts can be created, allowing over 780 different character-sized blocks to be printed to form a very high-resolution picture.

As a word processor, *Fontmaster II* is simple to use, considering its many unique capabilities. The cursor is a hollow transparent square, which makes typing easier, and an ever-present display above the screen ruler informs you of the status of up to 22 different features. This display changes to one of four different help screens, depending on the combination of the Commodore logo, CONTROL, and SHIFT keys pressed. Blocks of text are marked at either end with a simultaneous CONTROL-M keystroke, enabling them to be cut, pasted, moved, copied, or displayed on an 80-column preview screen, or even printed out with ease. The block printout option makes it possible to determine the final appearance of the printout without trashing several feet of paper, and also allows addressing envelopes without retyping the address. Short deletions can be done with the INST/DEL key, which deletes the character to the left of the cursor. A simultaneous CONTROL-G will gobble unwanted characters to the right. There are speedier ways to remove entire lines and blocks of text as well.

Text layout is accomplished with over 50 two-character formatting commands, each preceded by pressing the English pound key, shown as a fat arrow on the screen. These formatters control margins, tabs, line spacing, proportional spacing, left and right justification, centering, and pagination, to mention the more common functions. The position and use of repetitive page headers and footers are also defined by formatters, and have 15 separate commands of their own. Page numbers, if desired, can be printed in either Arabic or Roman numerals, and printed in the center, or in the right or left margin. Desktop publishers will appreciate the option of printing headers and footers alternately on the left and right for correctly paginated, camera-ready copy.

Control over the printed output is where *Fontmaster II* really shines. The program sends each character to the printer in the Graphics mode, with each line requiring two passes of the printhead. The 33 fonts consist of 29 normal fonts and four "superfonts." Normal fonts are formed on a 9 × 16–dot matrix while superfonts are laid out 18 dots across. This double resolution gives the latter a smoother and clearer appearance than normal fonts. Each font or superfont can be printed in three heights: micro (half a line high), normal (one line high), and tall (two lines high). In addition, characters can be printed in three widths (compressed, normal, and expanded), and the pitch, or the spacing between the letters, can be set in the range of 10 to 13 characters

FACTORY AUTHORIZED

COMMODORE REPAIR CENTER

1-800-772-7289

IN ILLINOIS (312) 879-2888

C64 Repair (cpu only)	42.95*	AMIGA Repair	CALL
1541 Repair	79.95*	C64 Power Supply	34.95
1541 Alignment only	29.95*	CBM & AMIGA PARTS	Call (312) 879-2350
C128 Repair (cpu only)	79.95*		

*Includes parts, labor & UPS return shipping. APO/FPO or Air Freight add $10.00

CALL BEFORE SHIPPING, VISA, MASTERCARD OR MONEY ORDER
24-48 Hrs. Turnaround (Subject to parts availability)
Diagnosis fee of $25.00 for any unit altered or with no defects.

SAVE YOURSELF SOME MONEY

Due to our vast experience in repairing 64s we have found that the power supply is a major cause of board failures. By inserting our device between the power supply and computer over 63% of our customer's repairs would have been avoided. For only $19.95 our C64 Over Voltage Sensor will continuously monitor your power supply output. If an overvoltage occurs the Over Voltage Sensor will prevent damage to your 64.

64 OVER VOLTAGE SENSOR $19.95

TEKTONICS PLUS, INC.
150 HOUSTON STREET
BATAVIA, IL 60510

CLIP AND SAVE

Your Long-Term Objective:
Bring the mission in at a profit.

Your *Immediate* Objective:
Bring Al Puhassis in before his oxygen's gone.

In the middle of a PROJECT: SPACE STATION simulation you may have to take instant action to save a crew member's life. Design an orbiting science project that turns a profit. Then pilot a shuttle back to earth without damage. It's more than "flight simulation." It's *mission simulation* — the same kind of challenges facing NASA today. See your software dealer or write us direct.

PROJECT: SPACE STATION

HesWare

P.O. Box 631-SCS, So. San Francisco, CA 94080
(415) 871-0570

per inch. The 13 CPI "konnect" pitch is particularly useful for the included script fonts and graphics. Subscripts and superscripts are also supported.

Unlike some other programs, *Fontmaster II*'s centering, justification, and proportional-spacing features all work perfectly regardless of the character width or pitch selected. Up to nine font slots are available for each text file. Since superfonts occupy twice as much space, four of these and one normal font—or nine normal fonts—can be used in any single document. Fonts, widths, pitches, boldfacing, and underlining are selected by simultaneously pressing a key with the Commodore logo key, which displays an inverse field character on the 40-column screen.

Printer manufacturers and many software producers are apparently less than completely aware of how diacriticals such as accents, cedillas, and umlauts are used in foreign languages. Typically, printers will print some, but not all, of the accented vowels needed. Even if backspacing the printhead is possible, it is awkward, and not all word processors permit it. *Fontmaster II*'s programmer, Marty Flickenger, thoughtfully provided two different ways to solve this problem. First, the accented vowels and inverted punctuation such as are used in Spanish can be defined as unused keys, such as @, &, or <. Second, any number of characters can be overlaid and printed simultaneously. This could be particularly useful for writing in a language requiring many diacriticals, such as Vietnamese.

Fontmaster II provides a great deal of versatility in other aspects of creating text. It's not necessary to decide when opening a file how many lines will be needed. Each file saved remembers which fonts were used, so after reloading a file, one need only type CONTROL-D followed by an N (for "fonts needed") to load them automatically. Fonts can be changed at any time. A text file can normally be up to 539 lines, or about 16 double-spaced pages long. Also, any font slots not used can be freed for 48 lines of additional text each. There is a formatter for chaining files together if this is not sufficient. CONTROL-? will inform the user how many bytes and lines of text remain available. The constant screen display provides this information in terms of the percentage of memory available.

It's also possible to print in up to four columns, to print form letters—retrieving variable data such as names and addresses from previously created sequential files, or to set the output for single-sheet printing. The RUN/STOP key is used as a helpful "panic button" that will abort printing and any other command.

The program provides an 80-column screen display, which can include variable data from the sequential files mentioned above. Although it does not actually show exactly what will be printed, this display comes close enough for most purposes, and includes headers and footers as previously defined. Actual "what-you-see-is-what-you get" displays require great amounts of memory, and are often more difficult to use than *Fontmaster II*'s formatters and embedded nonprinting characters because of the need for calling up fonts from the disk and eliminating unneeded files. When you're typing text, a 40-column screen is used with the words broken at the edge of the screen. I found that this does not seem to be particularly disturbing after some use.

Fontmaster II cannot perform word, sentence, and paragraph counts. It does not have a provision for mathematical calculations, and there is no spelling checker included. It's possible to save text either as a standard *Fontmaster II* program file or as a sequential file before adding the font codes and formatters, and then run the text through various other spelling checker programs, resave it, and reload it into *Fontmaster II*. The columnar printing feature requires backing up the paper manually if your printer has no paper-reversing command, which is slightly awkward. I've also discovered that moving blocks of text about a long file while in the insert mode can cause a lockup and possible data loss. This is a generic admonition that I've found applies to every word processor I've used. As each line requires two uni-directional passes of the printhead, the printing process is somewhat slower. However, a fast dot-matrix printout is available for rough drafts.

Successful desktop printing with *Fontmaster II* depends on your printer, which must be capable of double-density graphics to use all of the available features. The setup file lists 79 printers and 18 interfaces, and has a test for experimentation with any of these, especially helpful if your equipment is unlisted. Interfaces do not seem to present a problem, and DIP-switch settings are provided for interfaces and printers alike. Nearly all of the newer Star, Epson, Citizen, and Panasonic printers will print both normal fonts and superfonts. Commodore's MPS-801, 803, 1525, and 1526 printers, as well as the Commodore-ready Star SG-10C, are not listed as being capable of fancy printing with this program. I have used it with Star SG-10, Gemini 10X, and Panasonic 1091 printers with MW-350, Cardco +G, and Xetec interfaces, with excellent results. It might be helpful to write Xetec for a list of supported printers. The normal fonts, though slightly less defined than the superfonts, print out quite acceptably with a well-inked ribbon. The screen, border, and text can be any color, and can be changed at any time, so a color monitor is not necessary. It might be somewhat difficult to read the 80-column preview display on some color TVs, however. A chime is used to alert the user to errors and to insert another single sheet of paper, so a speaker could be helpful, but is not essential.

Fontmaster II's manual is far more readable than others I've seen, and allows the user to begin printing right away with a useful series of tutorials, followed by introductory, intermediate, and advanced topics. It includes several handy appendices and an excellent index at the end. There are some rather spectacular text files included on the disk which illustrate how the more complex features work. Also included is

FONTMASTER II EXAMPLES

This is how you expand text
You would compress text like this
Change to pica pitch
Select the pitch called "alternate"
This is the elite pitch
The Konnect pitch runs together
you must try boldfacing!
Trying the inverse feature
The second method of underlining
All of a sudden we change fonts

Go from normal to tall!
Go from normal to micro

tall normal micro normal
Einstein derived $E=MC^2$

Sulfuric acid: H_2SO_4
$y=x^{(2z+1)}$

S_{avg} = dist/time
S^{uper} and S_{ub}

A simple overlay: á A complex overlay: @

Fly Faster and Farther

with COMPUTE!'s

40 More Great Flight Simulator Adventures

This follow-up to the popular *40 Great Flight Simulator Adventures* brings you 40 more exciting, suspenseful flight simulator scenarios to help you get the most enjoyment from your *Flight Simulator* or *Flight Simulator II* software.

40 More Great Flight Simulator Adventures

Charles Gulick

Microsoft's *Flight Simulator* (IBM PC) and Sublogic's *Flight Simulator II* (Apple II, Commodore 64, Atari) are two of the most popular software packages today. They put you in the pilot's seat, letting you experience the thrill of flight. Now, *40 More Great Flight Simulator Adventures,* the second such guide, brings you more dazzling flights drawn from both fact and fancy.

Now you can fly where no one has flown before, with the author as your flight instructor. He helps you explore the unknown regions of flight simulation—taking you through cities, over mountains, under bridges—as you explore America from the air. Complete parameters and instructions at each step make flight easier and more exciting than ever before.

$9.95 ISBN 0-87455-043-2

Note: The *Flight Simulator* program itself is not included and must be purchased separately.

To order any COMPUTE! book, call toll free 800-346-6767 (in NY 212-887-8525). Or mail in the attached coupon with your payment. Include $2.00 shipping and handling per book.

Please send me _____ **copies of *40 More Great Flight Simulator Adventures* at $9.95 each. (ISBN 0-87455-043-2)**

All orders must be prepaid in U.S. funds.

Subtotal	_____
NC residents add 5% sales tax NY residents add 8.25% sales tax	_____
$2.00 shipping and handling per book ($5.00 per book airmail)	_____
Total amount enclosed	_____

COMPUTE! Books
P.O. Box 5038
F.D.R. Station
New York, NY 10150

☐ Payment enclosed (check or money order)

☐ Charge ☐ Visa ☐ MasterCard ☐ American Express

Name _____

Address _____

City _____ State _____ Zip _____

Please allow 4–6 weeks for delivery.

COMPUTE! Publications, Inc.
Part of ABC Consumer Magazines Inc
One of the ABC Publishing Companies
825 7th Avenue, 6th Floor New York, NY 10019
Publishers of COMPUTE! COMPUTE's Gazette COMPUTE's Gazette disk COMPUTE! Books and More, Atari Applications

COMPUTE! books are available in the U.K., Europe, the Middle East, and Africa from Holt Saunders, Ltd., 1 St. Anne's Road, Eastbourne, East Sussex BN21 3UN, England and in Canada from McGraw-Hill, Ryerson Ltd., 330 Progress Ave., Scarborough, Ontario, Canada M1P 2Z5.

"If you know BASIC and want to learn machine language, this is the place to start . . . . Building on your experience as a BASIC programmer, Mansfield very gently takes you through the fundamentals of machine language."

—Whole Earth Software Catalog

COMPUTE! Books' Best-selling Machine Language Books

"Understandable"—**The New York Times**

"Presents the machine language novice with a very good tutorial in simple, understandable terms."

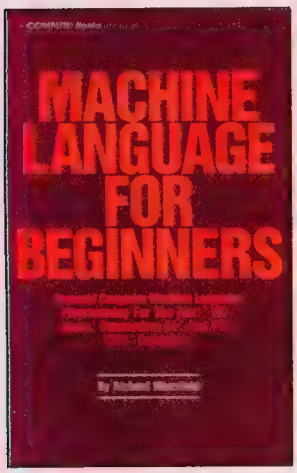
—**Antic**

"I highly recommend *Machine Language for Beginners* as your first introduction to the world of machine language."

—**Commodore Power/Play**

The LADS Disk

LADS, the assembler used in *The Second Book of Machine Language*, is available on disk for only $12.95. This is a great accompaniment to the book, saving you hours of typing time by providing the complete source and object programs for all versions of the assembler, and more. And LADS disks are specific to your Apple, Atari, or Commodore computers.



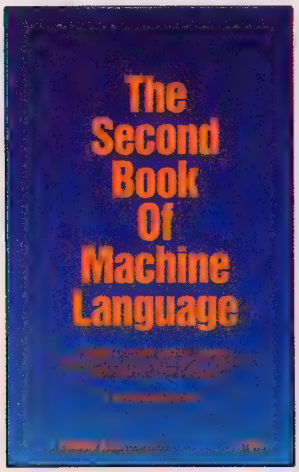
Machine Language for Beginners

Richard Mansfield

Most commercial software is written in machine language because it's far faster and more versatile than BASIC. *Machine Language for Beginners* is a step-by-step introduction. Includes a simple assembler, a disassembler, and utilities, to help beginners write programs more quickly and easily.

$14.95

ISBN 0-942386-11-6



The Second Book of Machine Language

Richard Mansfield

The follow-up to the best-selling *Machine Language for Beginners*, this book leads the programmer deeper into the most powerful and efficient programming techniques available for personal computers. Fully tutorial, with easy step-by-step explanations, the book shows how to construct significant, effective machine language programs. Included is a high-speed, professional-quality, label-based assembler. Everything that's needed for optimized programming on the Commodore 64, Apple, Atari, VIC-20, and PET/CBM computers.

$14.95

ISBN 0-942386-53-1

Machine Language for Beginners and *The Second Book of Machine Language*: everything you need to learn machine language programming on your Apple, Atari, and Commodore personal computers.

To Order: Call Toll Free 800-346-6767 (in NY 212-887-8525) or mail this coupon with your payment to COMPUTE! Books, P.O. Box 5038, F.D.R. Station, New York, NY 10150.

_____ *The Second Book of Machine Language*, (53-1), **$14.95**
_____ *Machine Language for Beginners*, (11-6), **$14.95**
_____ *LADS Disk* (Apple), (531APD), **$12.95**
_____ *LADS Disk* (Atari), (531ATD), **$12.95**
_____ *LADS Disk* (Commodore), (531CMD), **$12.95**

☐ Payment Enclosed (check or money order)
☐ Charge ☐ MasterCard ☐ Visa ☐ American Express

Acct. No. _____

Signature _____

Name _____

Address _____

City _____

State _____ Zip _____

_____ 1 Book for $14.95
_____ 2 Books for $25.00
_____ *LADS Disk* for $12.95

NC residents add 5% sales tax $_____

NY residents add 8.25% sales tax

Shipping and handling ($2.00 per book $1.00 per disk) $_____

Total Paid $_____

All orders must be prepaid.
Please allow 4–6 weeks for delivery.

COMPUTE! Publications, Inc.
One of the ABC Publishing Companies

Translator, a program which will convert program text files from *SpeedScript, PaperClip, Fontmaster I, Script 64, EasyScript, Fleet System II, Creative Writer,* and *Omniwriter*. Sequential text files can be loaded with a GET command from the Disk Command screen. Finally, this 80-page manual is not without a touch of humor: The index informs us that "the meaning of life" is to be found on page 92.

Personally, I consider *Fontmaster II* at its $49.95 list price to be a terrific value, and well worth the trouble of learning some new commands in exchange for the excellent printouts it delivers. I would recommend it to anyone with a need to print high-quality documents with a dot-matrix printer, write easily in a foreign language, or design spectacular resumes and letterheads without a trip to the typesetter. I've found that Xetec provides excellent support for its programs, and I would not be surprised to learn that some provision is forthcoming for upgrading to the announced 128 version planned for release in several months.

—Richard H. Eldridge

Xetec
3010 Arnold Rd.
Salina, KS 67401
$49.95

Vizastar 128

There's nothing quite like *Vizastar 128* for the Commodore 128: a powerful and flexible integrated spreadsheet, database, and graphics program.

Each application, if available separately, would be a good solid program. Together they offer the home and small business user a unique and powerful planning and reporting tool whose capabilities offer the maximum in flexibility. For instance, a salesman could set up an invoice form on his spreadsheet, include formula cells within the form to automatically calculate amounts, and produce invoices by drawing relevant portions of his customer database into the invoice form. Once through with his invoices, he could produce a summary of sales for the month in graphic form. All of this is accomplished without switching between two or three different programs.

The *Vizastar 128* package comes with a disk and a cartridge to plug into the user port. Since the cartridge acts as the program's copy protection, the disk is unprotected and may be backed up using normal copy programs. Also included with the program is an excellent manual that, in extremely organized and detailed fashion, explains the program's commands and features. A brief tutorial booklet is also provided to get you quickly into the program. However,

We offer an integrated family of software products that allow you to search the Bible as never before.

With "THE WORD Processor" software (which includes the complete text of the KJV or NIV Bible) you can create indexes on key words, phrases, even concepts, as well as search, display or print, for just $199.95. Greek and Hebrew Transliterator products which include Strong's Concordance are also available. Or choose from a host of other exciting Biblical software products available in varying price ranges.

So if you're still searching, give us a call. We're anxious to show you how your PC can help you access your Bible as never before.

Include $3.00 for postage and handling. For Apple, IBM PC, Commodore 64, TRS80, Kaypro, CPM 2.2, MS-DOS.

BIBLE RESEARCH SYSTEMS
2013 Wells Branch Parkway, Suite 304
Austin, Texas 78728 **(512) 251-7541**

THE ATARI TEN COMMANDMENTS # IV

"We shall create a computer that lets consumers choose what's right for them." Jack Tramiel

Some of our competitors insist that you do things their way. IBM®, for example, forces you to use command keys. And Apple®, forces you to use a mouse.

The revolutionary 1040ST™ Computer gives you both.

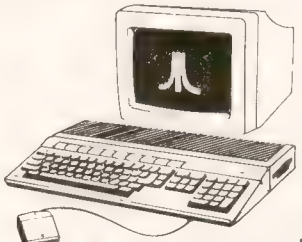
If you feel more in command with command keys and a professional keyboard, the ST™ has them. If you feel more comfortable with the immediate response of a mouse, the ST Computer has that also.

The 1040ST takes 16-bit, 68000 technology to its limit. It is two to four times more powerful than the Macintosh™ or the PC AT™ And far faster as well.

And you get all the power and performance of the ST for an incredible $999.

Which is why more and more people are choosing the ST Computer everyday.

The ATARI 1040ST is at your computer retailer now.



ATARI®

© 1986 Atari Corp ATARI, ST, & 1040ST are TM's or reg TM's of Atari Corp Apple is a reg TM of Apple Computer, Inc IBM & AT are TM's or reg TM's of International Business Machines Corporation Macintosh is a TM licensed to Apple Computer, Inc

you can expect to make frequent use of the manual because of the nature and power of the integrated applications. Supplementing the manual and tutorial booklet, the *Vizastar* disk contains several very good example files to play with and learn from. And, you'll find a money-back offer in which Solid State Software will return your money within 30 days of the purchase if you're not satisfied.

The program autoboots in 80-column display. (*Vizastar* will not run in 40 columns.) Once the program is loaded (a bit slow here), you're presented with the spreadsheet matrix and a command bar on the first couple of lines. It's easy to execute commands: Just type the first letter of the command in the command bar.

The heart of *Vizastar* is its powerful spreadsheet, boasting 64,000 cells (64 columns by 1,000 rows) and 60K of memory space. All spreadsheet commands and functions are performed within the spreadsheet matrix, including the setting up and printing of reports. The spreadsheet offers flexibility, power, and control over its application, plus the ability to adjust the layout of the matrix and to customize screen colors. Each column of the matrix can be adjusted from 3 to 75 characters in width. Up to 120 characters can be entered in each cell, and while not all can be displayed on your screen, they will print out correctly. Individual cells can contain text, a number, or a formula, and can be formatted in eight different ways (left- or right-justified text, centered text, integer, currency, date, scientific, and general).

By using the SHEET command, you have access to word processing sub-commands that facilitate a faster layout setup and subsequent manipulation of your spreadsheet. These commands include copying, moving, and deleting any cell or range of cells, inserting a column or row, erasing cell contents, sorting a row or rows, and setting up screen windows (up to nine on one screen). The copying and moving commands permit transfer of cell contents from column to column, or from column to row and vice versa.

Vizastar makes what-if calculations simple and quick by employing an automatic recalculation function that you can switch off and on. This means that immediately after changing any cell contents, the entire spreadsheet is checked by the program—and all cells affected by the altered cell's contents or formula will be recalculated. For example, a salesman can change the number of product units sold and immediately see the impact made on his commissions. *Vizastar*, however, defaults to manual recalculation, since automatic recalculation after every change in a cell's contents would make the initial setup or large changes a slow process. *Vizastar* also has the ability to recalculate by row or column.

Vizastar can handle just about any calculation you may need. Besides the basic arithmetic operations, *Vizastar* offers logical operators and several advanced function operators. The logical operators can be used together to create a compound logical test. The function operators perform more complex operations. They include algebraic, trigonometric, and exponential calculations, maximum and minimum values, a rounding function, and true/false statements. Two function operations rarely included in spreadsheets are the calculation of dates and what *Vizastar* calls *table lookup*. The program permits you to calculate the number of days between two specific dates. This is particularly helpful in financial calculations where interest accrual on loans and interest yields on investments are tied to the calendar.

Table lookup permits a cell to search a portion of the spreadsheet for a particular value and reference cells by their positon relative to the found cell. For example, you could search for a 5 and get the value of the cell to the right and put that value into the cell that did the lookup. It's complicated, but very useful.

Printing from *Vizastar*'s spreadsheet may be done in a number of ways. High-resolution screen dumps can be made with an Epson or compatible printer. Normal screen dumps are available for any printer. Custom reports can be printed to virtually any type of printer using the PRINT command. The OPTIONS sub-command permits you to identify a number of printing options, such as printer type, page length, lines per page, headers, footers, margins, and the range of cells to be printed. Additionally, *Vizastar* allows you to take advantage of your printer's special abilities. Once selected, your choices remain in effect during the current work session and are saved to disk with the spreadsheet file.

Because you start from scratch when you create a report layout, it takes a few minutes to set up. The program's flexibility, however, permits construction of just about any report layout you might need and incorporates sophisticated word processing printing features like text enhancements and different character sizes. *Vizastar* is also compatible with programs like *Sideways* which allow you to print (with dot-matrix printers only) a spreadsheet wider than 80 characters.

Vizastar provides extensive file and disk manipulation abilities, including the ability to merge two disk files. This lets you combine spreadsheets. You can list the disk directory onto the spreadsheet matrix, allowing you to print, annotate, sort, and save directory information. Word processing files—including those from *Vizawrite*, *Paperclip*, and *WordPro*—can also be brought onto the spreadsheet matrix. *Vizastar* also allows the loading of sequential Commodore ASCII files, so sequential files created by BASIC, or word processing files like *Easy Script* or *SuperScript*, can be loaded into the spreadsheet matrix. Finally, *Vizastar* offers disk maintenance commands such as erase and format, and permits the use of DOS commands from within the program.

Vizastar's most powerful feature is its macro-command system named Execution Lists, or Execs for short. Execs are miniprograms used to simplify some of *Vizastar*'s more complex features. As indicated earlier, printing a custom report can involve the use of many word processing features—such as headers and footers—and can draw upon information contained in both a spreadsheet and database file, making the generation of the report a tedious chore. Creating an Exec to do your report takes a few minutes, but once you create it, you can save it. Subsequent reports are printed by pressing F8.

Vizastar's database is as powerful as its sister application, the spreadsheet. The database's power and flexibility, combined with its ability to interact with the spreadsheet, make the database an especially attractive application for small business use. Up to 120 databases can be stored on a disk, each having up to 15 separate files. Each file can contain up to 1200 records (on a 1541 disk drive), and each record can contain as many as 8000 characters (120 characters per field) that can be displayed on up to nine screens per record and divided among 64 fields.

The design of *Vizastar* forces access to the database through the spreadsheet. This allows you to take advantage of the interaction available between the spreadsheet and the database, but appears foreign and awkward to someone used to a stand-alone database.

To access a database, you activate the DATA command on the menu bar. You are then presented with a sub-command menu allowing access to a database file, the creation of a new database, the transferal of information between the database and the spreadsheet, and the printing of selected information or reports.

Creating a database on *Vizastar* is both fun and quick. If you issue the USE and DATABASE sub-commands without identifying an existing database, *Vizastar* assumes that you want to create a new database. After naming the database and the file to be created (remember you can have up to 15

Introducing a new printer that's based on an old favorite.

The new Star Gemini II.
The printer that was made for your Commodore PC.

We took all the best features from our original Gemini,® our best-selling printer for Commodore® users.

Then we added enhanced Near Letter Quality printing…a built-in Commodore interface (with cable included)…a rear tractor feed…and an array of front panel controls that makes printing easier than ever.

The result? The new Star Gemini II. A printer designed to help your Commodore's performance. Without hurting your budget.

Now at Toys 'R' Us and other major chain stores.

In front with quality up front.

star micronics

The new Star Gemini II.

® Commodore is a registered trademark of Commodore Business Machines, Inc

different files in your database), you are presented with a screen to create your file layout. From here, you can paint or highlight using the character and color of your choice. Fields can be preceded by text and can be formatted with the same options as spreadsheet cells explained earlier. Once you've finished creating a maximum of nine layout screens for each record, you can save the layout to disk. You're now ready to begin entering information. If the screen layout needs to be altered, you can freely move fields within the screen and otherwise alter the layout by using the SETUP subcommand. Anyone who has set up a database and loaded in a lot of information, only to discover that the layout needs restructuring or an additional field needs to be inserted, will appreciate this feature.

Each field in your layout is identified by a one- or two-letter code from *A* to *BL*. These codes correspond to the 64 columns of the spreadsheet matrix and permit the movement of information between the spreadsheet and the database. Additionally, each field can contain a formula, which can include any of the operators available from within the spreadsheet. Not only can formula fields be used to show the results of other fields within the database, but they also can directly or indirectly reference the spreadsheet.

Once having identified the desired file to *Vizastar*, access to the database is easy. By using the ACCESS command, you can "leaf" through the records of your file, and add, replace, and delete fields or whole records. *Vizastar* employs a key-field system to organize records. The key field of a record is the field identified with the code *A*. Instant access to any record can be had if the key field is known. Broader searches can be accomplished using the CRITERIA subcommand. With this you employ a portion of the spreadsheet matrix to define the search criteria. The criteria used for the search would be placed in a cell in the spreadsheet corresponding to the field. For instance, if you wanted to find all persons whose last name is Smith that live in Denver, and field A contained the names of the persons in the database file and field B contained the name of the city where those persons lived, you would identify two cells in the spreadsheet matrix as the *criteria range*. Those two cells would be columns A and B of any unused row.

As mentioned, *Vizastar* makes it easy to transfer data between a spreadsheet and database file. The database is also equipped to export and import information to and from other programs. You can send database file data to a standard Commodore ASCII sequential file, and vice versa.

Last but not least, *Vizastar* produces some outstanding graphs. Using a high-resolution display, *Vizastar* can produce great-looking bar, multibar, and pie graphs using information from either the spreadsheet, database records, or both. The multibar and pie graphs employ color graphics and are extremely clear. I was most impressed with the multibar graphs, which can be expanded from display screen size to a full 8½ × 11 page size. Multibar graphs are intentionally drawn slowly for effect, but can be drawn instantly if you hold down the SHIFT key.

Graphs are drawn directly on the spreadsheet matrix, and by designating a window on the screen, you can display the graph while retaining a portion of the spreadsheet's text and figures. If recalculation of spreadsheet cells is in the automatic mode, a bar graph will be automatically redrawn upon the alteration of cells that constitute part of the graph. Labeling is available. Finally, a bar graph can be saved with a spreadsheet file, and when the file is recalled, the graph will be redisplayed.

Vizastar permits printing of any of the graphs it can generate, but apparently only supports Commodore and Epson or compatible dot-matrix printers. I did not have the opportunity to print out a multibar graph in color, but a black and white print of a graph on my Epson printer had exceptional clarity.

In summary, *Vizastar 128* is a gem of a program, with enough power and flexibility to satisfy even the most demanding home and small-business user. Its shortcomings (if one can call them that) arise from the program's complexity. Kelvin Lacy has written an intelligent program that takes as much of the drudgery out of spreadsheet and database applications as could be expected. The 64 version of *Vizastar* has been compared to *Lotus 1-2-3* for IBM computers, which is stretching things a bit. However, if you use or have used *Lotus 1-2-3*, and are looking for something comparable for your Commodore, *Vizastar 128* is as close as it comes.

—Scott Thomas

Solid State Software
1125 East Hillsdale Blvd.
Suite 104
Foster City, CA 94404
$119.97

Nam

Drained of its enormous political implications, the war in Vietnam makes for an interesting military study. The differences between the two armies are fascinating, as the guerilla-trained Vietcong takes on the more conventionally trained U.S. troops. Equally interesting is the problem of mounting a battle in the middle of a jungle. On a small-unit level, where politics does not enter, the fighting can be examined on its own terms.

To judge from SSI's *Nam* game for the Commodore 64, fighting in Vietnam was both confusing and deadly. *Nam* is a one-player game, with the player controlling the U.S. forces. The computer takes care of the Vietcong troops, and a formidable opponent it is. True to the nature of Vietnam conflicts, the VC are hidden until they move, fire, or are hit by fire—and just when you think you've found them, they disappear again, only to emerge wherever you don't expect them. *Nam* re-creates the U.S. troops' sense of impending ambush.

The attractive map is divided into small squares, each representing 50 meters of terrain. The map scrolls to provide a large playing surface, and both U.S. and Vietcong forces may be scattered about in various locations. In most scenarios, the dominant terrain is jungle. The game portrays, simply and effectively, how immensely difficult it is to fight an enemy that uses jungle as its defensive terrain. This is cautious, plodding fighting, where positions are hit one by one and sheer numbers do not always win.

As in most SSI war games, play is divided into phases. The Observation Phase allows you to examine the status of your units and to have them "dig in" for the best possible defense. In the Artillery Plot Phase, you aim your off-map artillery at likely targets. In following phases, the enemy fires and moves, and then your own units may fire at enemy units they can see. Next, you move your units, suffer enemy fire, and fire offensively one more time. After this, the plotted artillery fire falls roughly where you ordered it—even if your own troops now occupy the spot. In the Victory Phase, you receive points for units you have eliminated. Your current progress is then displayed on the screen.

The game includes six scenarios, each with variants for play flexibility. The first re-creates the Suoi Cat ambush of December 1966, demonstrating the battle's quick buildup. Ap Bau Bang is based on the March 1967 U.S. effort known as Operation Junction. In the third scenario, Ia Drang, you command the Air Cavalry in a clearing operation, while scenario four, Tuy Hoa, demands that you clear the underground caves of enemy forces. Two somewhat different scenarios are Ben Het, which simulates the March 1969 armor battle, and Hue, in which you fight to clear the city of entrenched and deadly VC snipers and troops. After the jungle of the previous scenarios, the city looks inviting, but taking it is tough.

With the game's functions under joystick control, *Nam* is a fairly easy game to play. It is detailed, but not overwhelmingly so; and its lack of focus on troop morale, which would seem a must for a Vietnam simulation, is more than made up for by the rigors of finding, engaging, and destroying the enemy. If you want a war game that does not require a huge commitment of time, that teaches you something about an interesting war, and that can be played without spending an hour or more ingesting rules, *Nam* is probably for you. If you are new to computer war gaming, *Nam* provides a good start. It's a solid product.

—Neil Randall

Strategic Simulations (SSI)
1046 N. Rengstorff Ave.
Mountain View, CA 94043
$39.95

Ultimate Wizard

In the race for better and better computer games, some software designers seem to have moved away from the quick-reflex action games that did so much to launch the personal computer industry and the Commodore 64. But one point may be lost in this movement: Arcade games can be a lot of fun. *Ultimate Wizard* is one such game. Like most arcade games, its line of descent is clear, from *Donkey Kong* through *Jumpman* through *Lode Runner*. In fact, part of its charm is its instant playability: Just load it, watch the prompts, and start playing. The instructions are short and mostly unnecessary, as arcade instructions should be. In the Commodore 64 version, the instructions can be read as the game is loading.

In *Ultimate Wizard*, you control a small wizard, who jumps and climbs his way through the dungeons of Kaytel. Each dungeon occupies one screen, with treasures you must pick up and dangers you must avoid. The object in all the dungeons is to find a key and take it to the keyhole. Once you do this, you enter the next dungeon. By collecting as many treasures as possible and getting through the dungeon quickly, you gain additional points. It's not necessary, unlike some games, to collect all the treasures before leaving the current dungeon. Finding the key, however, often depends on collecting specific treasures.

The opening screen allows you to opt for a demonstration, playing the game, or creating your own screen. For some reason, the designers have elected to allow you only ten seconds to make the choice, which means that if your joystick is plugged into the wrong port, you have a race on your hands. Once past this screen, the program has no other annoyances. The next screen allows you to choose your level of play, from Beginner through Expert, or it will randomize the dungeons for you. You then select the number of players and the speed at which everything moves. Slow speed at the Beginner's level is excruciating; high speed at the Expert level is, for me, impossible.

An option that *Ultimate Wizard* does not have, but which I have seen in no arcade games outside the old Atari 2600, is handicapping. Why is it not possible for each player to select unique beginning levels and speeds? I mention this because *Ultimate Wizard* has become a favorite with the neighborhood youngsters, and playing ability varies greatly. If all the kids could select their own starting point, play would be fair. This problem is not unique to this game, but it seems to be something that should have been addressed.

Where *Ultimate Wizard* shines, though, is in its variety of play and its use of graphics and sound. Each dungeon is different, with its own peculiarities and its own challenges. Each demands its own strategy and its own types of skills. And the entire game is filled with interesting and charming sound effects. Bells, whistles, pops, cracks, explosions, music: Every second of the game is accompanied by some kind of sound. The sounds very effectively lend the atmosphere of strangeness and mystery so necessary to the dungeon setting.

The game contains 100 levels. So far I've managed to master about 20, with some occasional successes at higher levels. And this is after many hours of play. *Ultimate Wizard* also contains a detailed construction set, which allows you to create your own levels. Anything the original 100 levels can do, you can recreate in the construction set. Creating a dungeon takes a fair bit of time, especially when you're learning, but for those who tire of the original dungeons, the process makes the game endlessly playable.

For me, though, the original 100 are plenty, at least for now. They give me enough treasures, enough monsters, enough impossible leaps and climbs to last me for a long time to come. Somewhere, I suppose, someone will finish the 100th level, read this review, and say, "What's he talking about? This isn't so hard." If that happens, and if the person is under 20 years of age, do me a favor. Don't tell me. I don't want to know.

—Neil Randall

Electronic Arts
1820 Gateway Dr.
San Mateo, CA 94404
$29.95

NOW GET TRUE DESCENDERS FOR 801, 1525, 803, GP-100, HUSH 80 & SIMILAR PRINTERS

From the Descender ROM People

WILANTA ARTS

SAMPLE ACTUAL SIZE

FEATURING:

GYPSY
pager
peopl

- True descenders
- A pleasing alternative
- Uniform character formation
- No change in graphic capability
- No change in software compatibility
- No change in printer operation
- North American standard font
- Complete instructions
- Easy installation
- No soldering

$39.95 Cdn $29.95 U.S.

Ont. Residents add 7% Prov. Sales Tax
Cheque, Money Order, Visa or MasterCard

VISA MasterCard

WILANTA ARTS
1688 Sir Monty's Dr.
Mississauga, Ontario
L5N 454

1-416-858-9298

Get a Wilanta Descender ROM Today and make your old nightmare Just a font memory of yesterday!

---

tensoft presents

ARITH METICIAN

An Exciting Arithmetic Game for the Commodore 64® and Commodore 128™

- $24.95 A great value.
- Covers all skill levels from 1 digit addition to 7 digit long division.
- Grades 1 to 6 to adult.
- Easy to use.
- Arithmetician is a game of arithmetic practice that is filled with action, music, and animated cartoons.

Order by phone TOLL FREE with Visa or MasterCard
1 800 828 1829 In California call 1-800-626-6126

☐ Please send me _____ Arithmetician disks at $24.95 each
(California residents add 6% Sales Tax)
[ ] Send more information only
[ ] Check or money order enclosed
☐ Visa ☐ MasterCard

Account No. _____ Exp _____
Signature _____
Name _____
Address _____
City/State _____ Zip _____
Phone _____

Send to: **tensoft, P.O. Box 86971, San Diego, CA 92138**

Commodore 64 is a registered trademark of Commodore Electronics Ltd
Commodore 128 is a trademark of Commodore Electronics Ltd

simple answers to common questions

Tom R. Halfhill, Staff Editor

Each month, COMPUTE!'s GAZETTE tackles some questions commonly asked by Commodore users. If you have a question you'd like to see answered here, send it to this column, c/o COMPUTE!'s GAZETTE, P.O. Box 5406, Greensboro, NC 27403.

Note to Readers: In the October 1986 "Simple Answers to Common Questions," a reader asked about changing a disk name without reformatting the disk. We answered that there's no easy way to do this and suggested two methods—neither very convenient: either use a disk-editing utility, or format a new disk with the desired name and copy all of the files.

Evidently this is a much more common question than we thought. We were soon deluged with letters offering simpler answers. In fact, we received more mail on this question than on any other topic in the 3½-year history of "Simple Answers to Common Questions."

Numerous readers enclosed various programs to change the disk name. We can't print them, however, because the senders usually weren't sure if the programs were copyrighted or in the public domain. Also, some of the programs were quite lengthy.

Fortunately, several readers—including R. F. Nevin, Pat McConville, Charles Springer, Robert B. Slota, Jason MacNeil, and Diana Shaffer—pointed out that the solution has already been published in the July 1985 issue of COMPUTE!'s GAZETTE. That issue's Power BASIC feature, "Disk Title Changer" by Michael Broussard, solves the problem with an efficient little program that's only eight lines long. You'll find it listed below.

Another reader, John T. Livingston, referred us to "Disk Tricks" by Gerald E. Sanders in the September 1984 issue. This article explains in detail how Commodore 1540/1541 disks are organized and provides four programs for modifying disks—including one that changes a disk name.

Incidentally, another program in "Disk Tricks" is designed to change the disk's ID as well. Once you format a disk, however, its two-character ID is permanent and cannot be changed without reformatting. The "Disk Tricks" program changes the ID listed on the directory, but it's merely a cosmetic change. Since we're frequently asked about changing disk IDs, we'll repeat: *The disk ID cannot be changed without reformatting the disk.*

Bernard A. Sobel brought to our attention a program called "Disk Surgeon" in *COMPUTE!'s Third Book of Commodore 64*. "Disk Surgeon" is a consolidation of the four programs by Gerald E. Sanders in the "Disk Tricks" article.

Finally, Gary A. Mohr mentioned a program called "Header Change" included on the 1571 Test/Demo disk that comes with every 1571 disk drive. It's three times as long as "Disk Title Changer," but it gets the job done.

We also received the following letter offering advice to the reader who recently acquired a VIC-20 computer, but lacked hardware and software ("Simple Answers," September 1986):

First off, many Toys "R" Us outlets still have VIC software on cartridges. Mostly games, but I have picked up an expansion board there and a 16K [memory] cartridge. If he has more than one Toys "R" Us in his area and checks them all, he might come up with some interesting items.

Next is K mart. They sold the VIC longer than anyone except Toys "R" Us, and there is usually still something on the shelf. (For you Timex/Sinclair 1000 owners, this is a good source, too.) I managed to find an RS-232 interface at a K mart.

For software, write to the following addresses: The Public Domain Software Copying Company, 33 Gold Street, New York, MY 10038; and the National Software Lending Library, 507 Race Street, Cambridge, MD 21613. The Public Domain Software Company sells software on disks, but it can be easily copied to tape. The price is nominal. The National Software Lending Library charges a lending fee, but they have both tapes and disks. They have games, utilities, productivity software, etc.

These are the best sources I have found, but don't discount the local user group. These people probably started with a VIC-20 and may have all kinds of software just lying about. Don't forget that Commodore sold millions of these machines, and they're still out there somewhere. I watch the used merchandise ads in the local papers, and in two years I've only seen maybe a half-dozen VICs for sale. Try these sources and keep looking. You'll be sure to find more.

Peter D. Eikenberry

Our thanks to the many readers who wrote with helpful suggestions.

Disk Title Changer

```
SX 10 CLOSE15:OPEN15,8,15:PRIN
      T#15,"I0:":CLOSE5:OPEN5,
      8,5,"#":B$=""
QQ 20 PRINT#15,"U1:5,0,18,0":P
      RINT#15,"B-P:5,144"
HJ 30 FORJ=1TO16:GET#5,A$:A$=C
      HR$(ASC(A$+CHR$(0))):B$=
      B$+A$:NEXT
ER 40 PRINT:PRINT"DISK NAME: "
      ;B$
EA 50 INPUT" NEW NAME";N$:IFLE
      N(N$)>16THENPRINT"MAXIMU
      M LENGTH IS 16":GOTO40
DS 60 IFLEN(N$)<16THENN$=N$+CH
      R$(160):GOTO60
PM 70 PRINT#15,"B-P:5,144":PRI
      NT#5,N$;:PRINT#15,"U2:5,
      0,18,0":CLOSE5
PP 80 INPUT#15,ER,ER$:PRINT"DI
      SK STATUS:"ER;ER$:PRINT#
      15,"I0":CLOSE15:END
```

NRI Trains You At Home—As You Build Your Own IBM-Compatible Computer

GET THE KNOW-HOW TO REPAIR EVERY COMPUTER ON THIS PAGE.

Learn the Basics the NRI Way—and Earn Good Money Troubleshooting Any Brand of Computer

The biggest growth in jobs between now and 1995, according to Department of Labor estimates, will occur in the computer service and repair business, where demand for trained technicians will actually *double.*

You can cash in on this opportunity—either as a full-time corporate technician or an independent service-person—once you've learned all the basics of computers the NRI way. NRI's practical combination of "reason-why" theory and "hands-on" building skills starts you with the fundamentals of electronics, then guides you through advanced electronic circuitry and on into computer electronics. You also learn to program in BASIC and machine language, the essential languages for troubleshooting and repair.

Total Computer Systems Training, Only From NRI

No computer stands alone . . . it's part of a total system. To really service and repair computers, you have to understand computer *systems.* And only NRI includes a complete computer system as part of your training.

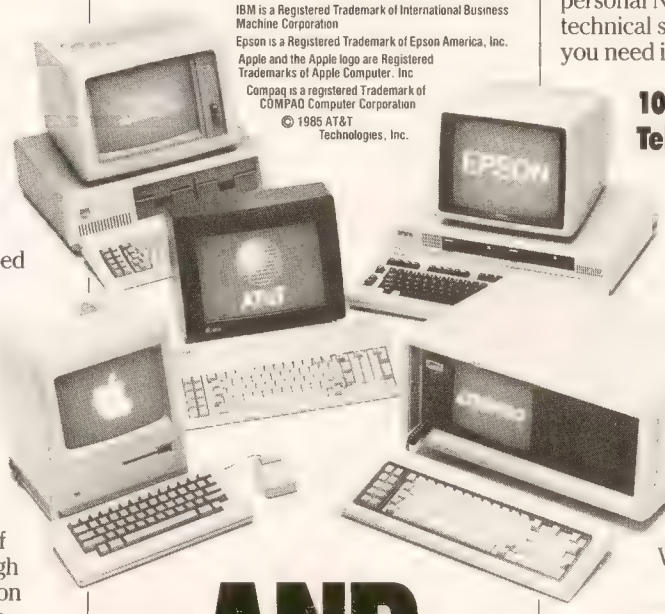
You start with the step-by-step assembly of the highly rated, IBM PC compatible Sanyo 550 Series computer. You install and troubleshoot the "intelligent" keyboard. Then you assemble the power supply, install the disk drive and extra memory to give you a powerful 256K RAM system.

Finally, you interface the high-resolution monitor and dot-matrix printer and begin to use the $1,000 worth of software that's included. You're learning about, working with, and troubleshooting an entire computer system—monitor, keyboard, computer, disk drive, power supply, and printer—all the essentials you'll meet every day as a professional computer service technician.

No Experience Needed, NRI Builds It In

Practical, hands-on experience that gives you the skills you need for success. You learn in your own home. No classroom pressures, no night school, no need to quit your present job until you're ready to make your move.

Your training is backed up by your personal NRI instructor and the NRI technical staff, ready to help you when you need it. You get it all from NRI!



IBM is a Registered Trademark of International Business Machine Corporation
Epson is a Registered Trademark of Epson America, Inc.
Apple and the Apple logo are Registered Trademarks of Apple Computer, Inc
Compaq is a registered Trademark of COMPAQ Computer Corporation
© 1985 AT&T Technologies, Inc.

100-Page Free Catalog Tells More

Send the coupon today for NRI's big 100-page color catalog on NRI's electronics training, which gives you all the facts about NRI courses in Microcomputers, Robotics, Data Communications, TV/Audio / Video Servicing, and other growing high-tech career fields. If the coupon is missing, write to NRI Schools, 3939 Wisconsin Ave., Washington, D.C. 20016.

AND MORE.

Your NRI course includes the • IBM PC compatible Sanyo computer with memory expansion to 256K RAM • high-resolution monitor • double-density/double-sided disk drive • "intelligent" keyboard • dot-matrix printer with near-letter-quality mode • NRI Discovery Lab® to teach circuit design and operations • digital multimeter • logic probe • spread sheet • word processing software—and more.

SEND COUPON TODAY FOR FREE NRI CATALOG!

NRI SCHOOLS
McGraw-Hill Continuing Education Center
3939 Wisconsin Avenue, NW, Washington, DC 20016
We'll give you tomorrow.

For Career courses approved under GI Bill ☐ check for details

☑ CHECK ONE FREE CATALOG ONLY

- ☐ **Computer Electronics with Microcomputers**
- ☐ TV/Audio/Video Servicing
- ☐ Satellite Electronics
- ☐ Robotics & Industrial Controls
- ☐ Data Communications
- ☐ Industrial Electronics
- ☐ Communication Electronics
- ☐ Electronic Design Technology
- ☐ Telephone Servicing
- ☐ Digital Electronics Servicing
- ☐ Basic Electronics
- ☐ Bookkeeping & Accounting
- ☐ Appliance Servicing
- ☐ Small Engine Repair
- ☐ Air Conditioning, Heating & Refrigeration
- ☐ Locksmithing & Electronic Security
- ☐ Building Construction
- ☐ Automotive Servicing

Name (Please print) Age

Street

City/State/Zip

Accredited by the National Home Study Council 153-162

Todd Heimarck
Assistant Editor

People say that the 128's BASIC 7.0 has scads of useful commands. Just how powerful is BASIC 7.0? Let's pose a challenge: to write a complete working program for the 128 that fits on one screen. When the program is listed, you must be able to see the entire program on the 40-column screen.

Sliding Numbers

The first game is derived from a puzzle that's been around for hundreds of years. The basic idea is that you have a four-by-four grid (16 spaces) that contains 15 tiles numbered 1–15, plus a blank space. The grid starts out with the numbers in order (1–4 on the top line, 5–8 on the second, and so on). The space is in the lower right-hand corner.

It would be too easy to use regular characters, and it wouldn't look very interesting to put a tiny four-by-four grid on the regular text screen, so the program prints large characters on the hi-res screen. This is a computer game, so the tiles are labeled in hexadecimal. The letters *A–F* replace the numbers 10–15.

A word of warning to anyone who types this in: Lines 30 and 100 are four lines long. You must type them without any spaces at all. After typing line 30, cursor back to the line before pressing RETURN. The program does fit on one screen, but the READY prompt pushes the top line off the screen. To see the whole program, press ESC and then M to turn off scrolling.

The hi-res GSHAPE and SSHAPE commands are the key to moving the large characters. After drawing a shape on the hi-res screen, you can save a portion of it into a variable with SSHAPE (see line 30). Later, you can rubber-stamp the shape anywhere on the screen with GSHAPE.

The CHAR command in line 20 puts the characters "123456789 ABCDEF " on the hi-res screen. Line 30 SSHAPEs them into a string array. Several calculations (lines 30–60) expand the shapes to a larger size. Lines 80–100 are the main loop of the program. To move the tiles around, press the numbers 2, 4, 6, and 8 on the numeric keypad.

(Before typing in this program, refer to the article "How to Type In COMPUTE!'s GAZETTE Programs," which appears at the beginning of the program listings section.)

```
EE 10 FAST:DIMNC$(15),LC(15,1)
      :Z$=CHR$(0)
AR 20 FORJ=1TO9:NL$=NL$+Z$:NEX
      T:GRAPHIC1,1:CHAR1,0,0,"
      123456789ABCDEF ":FORJ=0
      TO15:LC(J,0)=J:LC(J,1)=J
      :NEXT
AD 30 FORX=0TO15:COLOR4,X+1:NC
      $(X)=NC$(X)+NL$:SSHAPELH
      $,X*8,0,X*8+7,7:FORY=1TO
      8:V=ASC(MID$(LH$,Y)):FOR
      J=0TO7:P=2↑J:M(J)=(VANDP
      )/P:NEXT:C(0)=224*M(7)+2
      8*M(6)+3*M(5)
PE 40 C(1)=128*M(5)+112*M(4)+1
      4*M(3)+M(2)
XQ 50 C(2)=192*M(2)+56*M(1)+7*
      M(0)
KG 60 FORJ=0TO1:FORK=0TO2:NC$(
      X)=NC$(X)+CHR$(C(K)):NEX
      TK,J,Y:NC$(X)=NC$(X)+NL$
      +CHR$(23)+Z$+CHR$(21)+Z$
      :NEXT:SLOW:SCNCLR
MC 70 FORJ=0TO15:QY=(JAND12)/4
      :QX=JAND3:GOSUB110:NEXT
HJ 80 CF=LC(15,0):RX=CFAND3:RY
      =INT(CF/4)
QX 90 GETKEYM:NX=RX+(M=6)-(M=4
      ):NY=RY+(M=2)-(M=8):IF(N
      XAND4)OR(NYAND4)THEN80
HR 100 NL=NX+NY*4:CT=LC(NL,1):
       LC(CT,0)=CF:LC(15,0)=NL
       :LC(CF,1)=CT:LC(NL,1)=1
       5:QX=NLAND3:QY=INT(NL/4
       ):J=15:GOSUB110:QX=CFAN
       D3:QY=INT(CF/4):J=CT:GO
       SUB110:GOTO80
FG 110 GSHAPENC$(J),QX*24+116,
       QY*21+56,XOR((JAND4)/4,
       JAND1):RETURN
```

Auto Race

The next program is even shorter and easily fits on one screen.

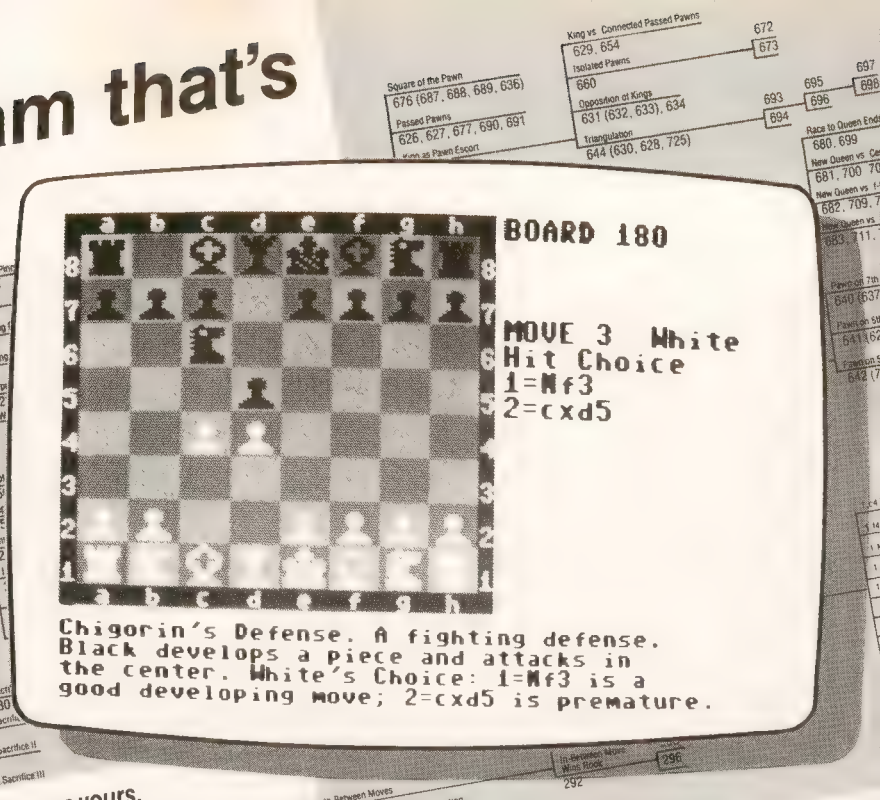
```
SF 10 R=RND(-TI/91):TRAP130:SC
      NCLR:COLLISION2,140
JF 20 TR$="*{14 SPACES}*":P=10
      :D=0
FX 30 SD$=CHR$(19)+CHR$(27)+"W
      "
HA 40 BLOAD"CARSHAPE",B0
ME 50 MOVSPR 1,160,180:SPRITE1
      ,1,2
BA 60 PRINTSD$;TAB(P);TR$;
EE 70 R=RND(1):IFR<.1THEND=INT
      (RND(1)*3)-1
XX 80 P=P+D:IF P<0 THENP=0:D=1
      :ELSE IFP>23 THEN P=23:D
      =-1
PQ 90 PL=JOY(2)AND127:MR=INT(J
      OY(2)/128)+1
AS 100 X=(0-3*(PL<5ANDPL>1)+3*
       (PL<9ANDPL>5))*MR
CB 110 MOVSPR1,+X,+0
PK 120 PT=PT+2:CHAR1,0,23,STR$
       (PT):GOTO60
RS 130 SCNCLR:SPRITE1,0:PRINTE
       RR$(ER)"IN"EL:STOP
PK 140 PRINT"{BELL}";:PT=PT-10
       :RETURN
```

In line 140, PRINT"{BELL}" might cause some confusion. CTRL-G makes a bell sound on the 128, so when you get to the {BELL} character, hold down the CONTROL key and press G. To play the game, plug a joystick into port 2 and move it left and right to keep your car on the road. Hold down the joystick button to move back and forth more quickly. The points gradually accumulate unless you hit the edge of the highway, in which case you lose a lot of points in a hurry.

If you type in and run the program, you'll probably get a FILE NOT FOUND error in line 40. Before you can use this program, you must design a car sprite. First type SPRDEF to enter the built-in sprite editor, and when you're asked for a sprite number, enter the number 1. After designing the shape, press SHIFT-RETURN followed by RETURN to exit the sprite utility program. Before proceeding, enter this line in immediate mode: **BSAVE "CARSHAPE", B0, P3584 TO P3647**.

Line 60 takes care of the scrolling. The SD$ string ({HOME} followed by ESC-W) scrolls the screen down a line at a time. The COLLISION statement in line 10 makes the subroutine at line 140 automatically execute whenever the car hits a wall.

At Last! A Chess Program that's On YOUR Side!


BOARD 180
MOVE 3 White
Hit Choice
1=Nf3
2=cxd5
Chigorin's Defense. A fighting defense. Black develops a piece and attacks in the center. White's Choice: 1=Nf3 is a good developing move; 2=cxd5 is premature.

Paul Whitehead Teaches Chess $49.95

Now, over 40 hours of interactive animated chess instruction are yours, from the mind of an American Open Champion. For beginners to seasoned tournament players, the techniques of a top master are exposed!

Here is a sampling of what you will see come to life on the screen:

- Rules
- Chess Notation
- Opening Principles
- Piece Development
- Surprise Checks
- Greed
- Traps
- "Desperado" Moves
- Pins
- Forks
- Skewers
- Overloaded Pieces
- In-Between Moves
- Back-Rank Checkmate
- Smothered Mates
- Stalemates
- Sacrifices
- Blockades
- Fianchettoes
- The Lucena Position
- King & Pawn Endings
- The Active Rook
- Perpetual Check
- Tempo & Zugzwang
- Isolated Pawns
- Passed Pawns
- Opposition of Kings
- Triangulation
- Hypermodern Attack
- Classic Openings
- Quizzes
- Tactics For Each Piece
- Weak Points in the Opening
- Brilliant Queen Moves
- King as a Pawn Escort
- The 3-Pawn Breakthrough
- Opposite Color Bishops
- Good & Bad Pawn Positions
- Converting a Material Advantage to a Win
- Forcing Checkmate Using Various Piece Combinations

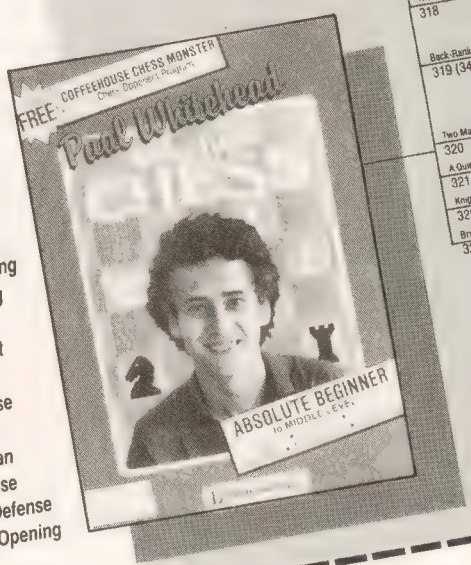
. . . and more!

OPENINGS:

- King's Gambit
- Ruy Lopez
- Scotch Game
- Giuocco Piano
- Petroff's Defense
- Alekhine's Defense
- French Defense
- Sicilian Defense
- Caro-Kann
- Pirc Defense
- Center Counter
- English Opening
- Bird's Opening
- Larsen Attack
- Sokolsky's Opening
- Benko's Opening
- Grob's Attack
- Queen's Gambit
- King's Indian
- Benoni Defense
- Nimzo-Indian
- Queen's Indian
- Dutch Defense
- Gruenfeld Defense
- The Dunst Opening

. . . and others!

IBM PC/PC jr (color or mono)
Apple II (64K)
Commodore 64
Atari ST (December 1st)



ROAD MAPS Each package includes a detailed two-sided ROAD MAP that lets you keep track of your journey through the tutorial database. The Road Maps label the parts of the tutorial both by topic and by Board Number. Using the Board numbers and the EXPRESS DEPOT feature, you can hop around the tutorial at will. You can also skip over material you already know.

FREE! COFFEEHOUSE CHESS MONSTER When you want to test your new knowledge against an opponent, a single key calls up the COFFEEHOUSE CHESS MONSTER opponent program. It will automatically set up the position you were viewing in the tutorial, offer you a new game, or let you enter a game from a newspaper listing. This is a fully-featured opponent program, which allows you to save an unlimited number of your own games onto disk, modify them, print them out, and re-animate them later.

► ORDER TOLL FREE! 1-800-621-0851 x 100

Enlightenment, inc.

YES! Please rush me PAUL WHITEHEAD TEACHES CHESS!

Name _____

Address _____ State ____ Zip ____

City _____

Please enclose $50.50 (outside Calif.) or $53.75 (Calif. residents - includes sales tax) per unit. . . includes shipping & handling. Please send to: ENLIGHTENMENT INC., 1240 Sanchez St., San Francisco, CA 94114.

DELIVERY: 5 days from receipt of order.

☐ IBM PC PC jr. ☐ Apple II ☐ Commodore 64 ☐ Atari ST

Enclosed is: $_____

The Roots Of Learning

Fred D'Ignazio
Associate Editor

Last summer my children—Catie, ten, and Eric, seven—had two remarkably different learning experiences. Catie traveled widely and went to a variety of summer camps, including computer camp, 4-H camp, mythology camp, and space camp. Meanwhile, Eric stayed home and went to summer school to boost his reading and math skills.

Catie had a wonderful summer. Eric, in the words of his teachers, "cried a lot" and was "moody."

Looking at my children's summer experiences, I can't help noticing the contrast in the way they were expected to learn. Catie spent her summer learning new skills through real-world experiences and simulations. At space camp, for example, she spent an entire week "training" in astronomy, water survival, computers, robotics, engineering, math, and design—as if she were an astronaut. The week came to a climactic end when Catie and her Sun team went on a space shuttle mission. As Mission Specialist One, Catie put to work what she'd learned so she could bring the space shuttle back to earth. Catie's counselors took delight in throwing complications at the kids to see how they'd do.

Deadly Digraphs

While Catie was flying around in outer space, Eric was in a classroom. He was deemed to have a short attention span while being drilled in initial consonant sounds, long and short vowel sounds, diphthongs, digraphs, blends, addition facts, subtraction facts, and every other kind of numerical and grammatical abstraction.

My wife and I enrolled Eric in a summer school math course because we hoped it would be an ego boost. Eric was a slow reader, but he was a whiz in math. Before the summer, he had loved math so much that he asked for word problems at night instead of bedtime stories. In a darkened bedroom, night after night, he solved complicated multistep problems in addition, subtraction, multiplication, and division. But after the end of a summer of instruction, his math teacher said he was no longer even up to grade level, and his attitude toward math was only "fair."

What happened? Why was Catie's learning experience so much better than Eric's?

According to Margaret Donaldson, in her classic *Children's Minds* (Fontana paperbacks, 1978), Eric's summer instructors expected him to learn through *disembedded thinking.* Disembedded thinking is reasoning not supported by human sense. It is "isolated from the rest of existence. What you may judge to be important apart from it, what you may know to be true—these considerations are to be excluded."

Reading, writing, and arithmetic are formal systems—disembedded thinking—that are the "basics" children are supposed to master in their early years of school. They are the prerequisites for success in the upper grades and for later in life. Yet according to new child-development studies, "There can be little doubt...that when we set such store by disembedded modes of thought we make the pursuit of education in our society a difficult enterprise for the human mind—one which many minds refuse at an early stage."

Donaldson reveals the crux of this problem, both for Eric and for many other children when she writes: "You cannot master *any* formal system unless you have learned to take at least some steps beyond the bounds of human sense, and...the problem of helping children to begin to do this in the early stages of their schooling—or even earlier—has not been properly recognized and is not usually tackled in any adequate way.... Thus we end up with a small number of educational 'successes' and a dismayingly large crop of 'failures.' And the urgent question is: how can this be avoided?"

Embedded Thinking

There is a paradox here. In recent years, researchers have gathered increasing evidence that, in direct contradiction to the findings of Jean Piaget, children are capable of some formal, or operational, thinking at a very young age—perhaps as early as three or four. Then why can't children learn how to do math and learn to read and write more easily? The answer is that children have trouble learning when they are asked to *think about things which have no meaning.* The child's mind tries to make sense out of new information introduced by his or her teacher. However, if the information is not related to a child's body, senses, or real-world experience—if it has no meaning to the child—the child will have trouble learning it.

Does this mean we should send our children to camp all year long instead of to school? No. As Catie's father, I know only too well how expensive that would be. But we do have an alternative to camp that's much less expensive: computers. Computers can let children simulate real-world experiences right in the classroom. Companies like Sunburst, Springboard, Grolier, Learning Well, Scholastic, DesignWare, MindScape, The Learning Company, and Spinnaker offer programs that teach language arts and math in the context of an activity or story in which the child plays a meaningful role. Stories bring drama, relevance, and meaning to abstract systems like phonics and arithmetic facts. And they embed thinking in the real world—the child's world.

bug-swatter

• Some users had a problem trying to redefine the NO SCROLL key using "KeyDef" (August). The problem can be traced to line 50, where the array which stores the names of the keys is initialized. The array is one element too small to store all the possible values generated by the keyboard. To correct the problem, all occurrences of the value 86 in line 50 should be changed to 87. Also, the name of the NO SCROLL key must be added to the end of the data in line 70. Finally, the names of some of the keys are assigned incorrectly in line 60. To correct each of these problems, substitute these program lines in your copy of KeyDef:

```
50 FORI=0TO9:K(I)=PEEK(4096+I)
   :POKE4096+I,0:NEXT:TRAP 180
   :DIMK$(87):FORI=0TO87:READK
   $(I):NEXT
60 DATA INST/DEL,RETURN,CR RT/
   LT,F7,F1,F3,F5,CR DN/UP,3,W
   ,A,4,Z,S,E,,5,R,D,6,C,F,T,X
   ,7,Y,G,8,B,H,U,V,9,I,J,0,M,
   K,O,N,+,P,L,-,.,":",@,",",
   £,*,;
70 DATA CLR/HOME,,=,↑,/,1,←,,2
   ,SPACE,,Q,RUN/STOP,HELP,,5,
   TAB,2,4,7,1,ESC,+,-,LF,ENTE
   R,6,9,3,,0,.,CR UP,CR DN,CR
    LT,CR RT,NO SCROLL
```

• As listed, "Sound Designer for the 128" (July) will not save sounds. After attempting to save a sound, its name appears in the catalog of stored sounds, but if you try to load it, you'll see a FILE NOT FOUND ON THIS DISK message. To correct this problem, you must first fix Sound Designer's save routine by changing line 1590:

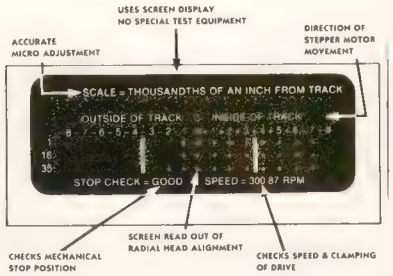
```
1590 OPEN15,8,15,"S0:"+FS$:GOS
   UB2080
```

Next, remove from the catalog file all sounds that were improperly saved using the original routine. Use the following lines to reset the catalog file. Type each line in immediate mode (without a line number) and press RETURN:

```
OPEN1,8,15,"S0:CATALOG":CLOSE1
DOPEN#1,"CATALOG",D0,U8,W:PRIN
   T#1,"**********":DCLOSE#1
```


"I Saved Time and Money with Physical Exam."

I use a data base program to keep records for our club. I work a couple of nights each week updating records. Last week I experienced read errors several times. Luckily I had purchased a copy of 1541 Physical Exam last month and had saved a printed copy of the alignment test results. Running a new alignment test confirmed what I had suspected, my drive had drifted out of alignment. I am happy to report that I aligned my drive MYSELF. I saved time, (as my drive didn't have to sit in our local dealer's service dept. awaiting repair) and money — the Physical Exam program costs a fraction of what repair centers charge. And I can use it numerous times!



Package includes:
- True digital alignment disk with offset tracks.
- Speed test
- Mechanical stop test
- Instructions for performing alignment, adjusting speed and stop position.
- Hard copy mode to print test results for future comparison & reference.

Physical Exam is available for these drives: 1541, 1571, 8050, 8250, 4040, and SFD 1001. *Please Specify Drive!* • **$39.95** EA. + SHIP.

Hours: MON-SAT 10-6

800-762-5645

Cardinal Software 14840 Build America Dr. Woodbridge, VA 22191 Info: 491-6494

THE ATARI
TEN COMMANDMENTS

V

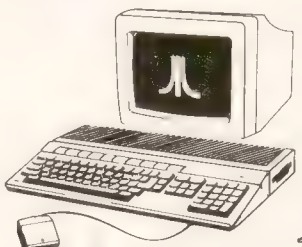
"We shall create a computer that gives consumers Power Without the Price." Jack Tramiel

Our amazing 1040ST™ Computer is the world's first PC to cost less than $1. per kilobyte.

How does that stack up against the competition? You'll pay over $2. per kilobyte for the Macintosh™ Plus. More than $7. per kilobyte for the Amiga™. And the PC AT™ kilobyte weighs in at a whopping $18. That's why the 1040ST brings new meaning to the word "value."

For a revolutionary $999., the ST™ Computer gives you a megabyte of memory. It's a complete package, with CPU, drive, monitor, and mouse. Its keyboard is packed with function keys and a numeric keypad. Expandability is a built-in bonus. There are industry-standard ports for printers, modems, and many other peripherals.

The ATARI 1040ST is a megabyte of muscle. And it's at your nearby computer retailer today.



ATARI®

© 1986 Atari Corp.
ATARI, ST & 1040ST are TM's or reg. TM's of Atari Corp. Amiga is a TM of Commodore-Amiga, Inc.
AT is a TM of International Business Machines Corporation. Macintosh is a TM licensed to Apple Computer, Inc.
Prices are manufacturers' suggested prices August 1986. Actual retail prices may vary.

Program Mis-Matcher

Mark Jordan

Programmers will appreciate this handy utility that compares two BASIC programs. Output is to screen or printer. For the Commodore 64, 128, Plus/4, or 16 with disk drive.

It happens often when you are programming: You want to know exactly how the program you're working on differs from a previously saved version. Or maybe you have two versions and you're not sure which one to load because you can't remember which is more recent—GAME2 or GAMEB. Maybe you've been doing some experimenting with an old program and like some of the changes you've made, but you don't like some others. Wouldn't it be helpful to compare the experimental version with the previous one to see which lines have been altered or added? "Program Mis-Matcher" helps out in situations like these. It compares two BASIC programs saved on disk.

Comparing

To use the program, Commodore 64 users should type in Program 1 as listed and save a copy on disk. Plus/4 and 16 users should type Program 1, but add or substitute the lines shown as Program 2. Now load the program and type RUN. The program asks for the names of two files. Type in the program names, pressing RETURN after each. Mis-Matcher will stop if it can't find the files on disk. The program then asks whether you want a listing of the differences to go to the printer. Press N to send the output to the screen only. The program assumes that the printer is connected as device 4. You'll need to change line 80 if you use some other configuration.

Commodore 128 owners can use the 64 version (Program 1). The program must be run in Commodore 64 mode, but it can be used to compare both BASIC 2.0 (Commodore 64) and BASIC 7.0 (Commodore 128) programs. One special restriction applies to comparing 128 programs if you have a 1571 disk drive: Both of the programs being compared must be on the front side of the disk. When used in conjunction with 128 mode, the 1571 can store data on both sides of the disk. Mis-Matcher will fail if either or both of the program files to be tested are on the second side. If they are, save both programs on a disk formatted while the drive is in 1541 mode (as when the computer is set for 64 mode). You can then use Mis-Matcher.

There are two ways in which one program may differ from another. First, one might have a line that's missing in the other. Second, the programs might have lines with the same line number which are not identical. Mis-Matcher recognizes and reports both kinds of differences.

Some assemblers, including the popular PAL for the 64, use the BASIC editor to enter source code. For such assemblers, Mis-Matcher can be used to compare two source-code files, so machine language programmers can also benefit from this tool.

See program listing on page 141.

COMPUTE!'s GAZETTE
TOLL FREE
Subscription
Order Line
1-800-247-5470
In IA
1-800-532-1272

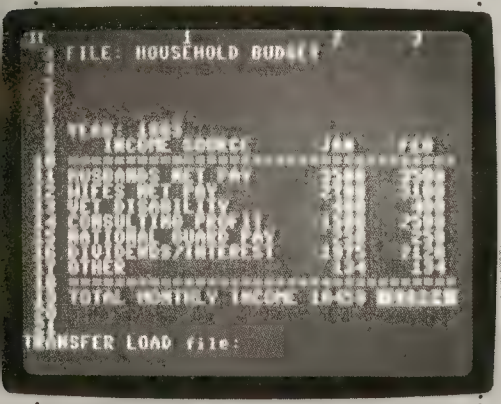
COMPUTE!'s Gazette is looking for utilities, games, applications educational programs, and tutorial articles. If you've created a program that you think other readers might enjoy or find useful, send it, on tape or disk to:

Submissions Reviewer
COMPUTE! Publications
P.O. Box 5406
Greensboro, NC 27403

Please enclose an SASE if you wish to have the materials returned.
Articles are reviewed within four weeks of submission.

All programs listed in this magazine are available on the GAZETTE Disk. See details elsewhere in this issue.

POWERFUL ENOUGH TO COMPUTE OUR NATIONAL DEBT. YET IT COSTS SO MUCH LESS.



Allow us to introduce the most powerful electronic spreadsheet in the Commodore world.

Multiplan.®

This is the same intensely simple, staggeringly brilliant program over a million Apple and IBM owners count on.

And now it will count for you, on any 64 or 128.

Ironically, however, though we recently lowered the price of Multiplan, we actually increased its capabilities.

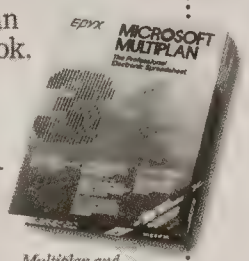
The enhanced version not only takes full advantage of the 128's expanded memory and 80 column screen.

Not only includes a *Quickstart* instruction manual.

And not only comes with 10 ready-to-go templates.

But it is the fastest loading spreadsheet you can buy. Which means in mere seconds you can check your checkbook. Take stock of your stocks. Or calculate your risks.

Multiplan works beautifully on a budget.



Multiplan and Microsoft are registered trademarks of Microsoft Corp.

You can plan, budget, analyze, question, ponder, revise, estimate and forecast.

Just by doing little more than pressing a few keys.

In fact, there really isn't any kind of hardcore number crunching you can't do faster and easier with Multiplan at your control.

Whether you're managing a family of 4. A business of 50. Or a nation of 250 million.

EPYX®

The Handicapper

Use your **Commodore 64/128** to improve your performance at the track! Programs for **Thoroughbred, Harness** and **Greyhound** racing rank the horses or dogs in each race quickly and easily. All the information is readily available from the *Racing Form*, harness or dog track program.

Thoroughbred factors include speed, distance, past performance, weight, class, jockey's record, beaten favorite and post position. **Harness factors** include speed, post position, driver's record, breaking tendencies, class, parked-out signs and beaten favorite. **Greyhound factors** include speed, past performance, maneuvering ability, favorite box, class, kennel record, beaten favorite and breaking ability.

Complete instructions and wagering guide included. **Thoroughbred, Harness** or **Greyhound Handicappers**, $39.95 each on tape or disk. Any two for $59.95 or all three for $79.95.

Federal Hill Software
8134 Scotts Level Rd.
Baltimore, MD 21208

MasterCard VISA®

Toll Free Orders 800-628-2828 Ext. 850
For Information 301-521-4886

V3.0 ULTRABYTE DISK NIBBLER

NEW SIXTH GENERATION ULTRABYTE COPIER FOR COMMODORE 64 and 128 (in 64 mode)

- **Copies 99+% of protected software in 2 min. or less includes parameters for 160 recent, hard-to-copy disks. (Send stamped envelope for list). Includes fast file copy program**
- **Uses 1 or 2 1541 /1571 drives, or MSD dual drive**
- **More powerful than KeyMaster, Diskbuster, Copy II, Superkit, 21 Second, Clone or Cracker**
- **Copies itself (for this reason, no refunds given)**

SPECIAL — BUY A NIBBLER V3.0 AND GET YOUR CHOICE OF A FREE $14.95 PROGRAM
$39.95 plus $4.00 shipping

Disk Surgeon -- disk utility $14.95
Ultramail -- mail list and label printer.....$14.95
McMurphy's Mansion -- text adventure $14.95
Handy-Capper -- race handicap system ...$14.95

(Above may be ordered separately for $14.95 plus $4.00 shipping. Foreign orders add $2.00)

Mastercard, Visa, Check or M.O., Calif. add 6.5% ($2.60) sales tax. Foreign orders / COD add $2.00. Payment must be in U.S. funds

UPDATES - Return your original Ultrabyte disk with $10.00 plus $4.00 shipping. Foreign add $2.00

To order, write or call 24 hr. order line. For info. write.

ULTRABYTE (818) 796 - 0576
P.O. Box 789 LaCanada, CA 91011 USA

DEALERS & DISTRIBUTORS WANTED

news & products

Commodore 64 Database

A new database for the Commodore 64, *Fastfile*, offers up to 31 fields per record and up to 256 bytes per record. Marketed as significantly faster than other databases for the Commodore 64, *Fastfile* is a memory-based, menu-driven database written in machine language. This database includes predesigned forms for a checkbook, mailing lists and labels, inventory, and tax form 8283. You can also create your own forms, and there's a 28-page illustrated manual.

Fastfile costs $59.95, plus $4 shipping and handling. Foreign customers should add $2 and Washington residents add 7.3 percent. No C.O.D.'s. There is a 15-day money-back guarantee.

Interactive Mini Systems, 5312 W. Tucannon, Kennewick, WA 99336.

Circle Reader Service Number 202.

More From Lucasfilm

Lucasfilm Games, which entered the home computer entertainment market a couple of years ago with *Ballblazer* and *Rescue on Fractulus* from Epyx, has released a new game in conjunction with Activision Software. *Labyrinth: The Computer Game* is an animated graphic adventure for the Commodore 64. It's based on the recent film directed by Jim Henson.

In *Labyrinth*, the evil Goblin King has captured you and locked you inside his Labyrinth, a twisting, winding maze of paths and passageways that lead to his castle. Along the way, you'll meet many characters, some of whom will offer their assistance, and others who will do everything they can to keep you trapped inside the Labyrinth forever. You use a joystick to control your animated character through a variety of strange locations, such as the Bog of Eternal Stench, the Wise Man's Garden, the Hall of Stone Faces, and the Wall of Hands.

Suggested retail price is $34.95.

Activision, P.O. Box 7286, Mountain View, CA 94039.

Circle Reader Service Number 203.

New QuantumLink Features

QuantumLink, a Commodore-specific telecommunications service, has introduced several new features among its offerings.

One addition is a SIG (Special Interest Group) for users interested in *GEOS* (Graphics Environment Operating System), an icon- and menu-based software program that gives the Commodore 64 a user interface similar to that of the Macintosh. This SIG provides support through question-and-answer sessions with Berkeley Softworks, the publishers of *GEOS*; conferences to discuss *GEOS* applications; and news on the latest *GEOS* developments and software.

QuantumLink has also introduced an online photo gallery, which uses specialized equipment to convert subscriber photographs into computer programs. Each program is then placed in the gallery for other users to download and display. Finally, the service has added more discounted products and a live auction to its shopping section, as well as a new information and news section on rock music—RockLink.

Quantum Computer Services, 8620 Westwood Center Dr., Vienna, VA 22180.

Circle Reader Service Number 204.

Spreadsheet Package

A new spreadsheet and statistical package from Echo Lake Laboratories, *ELBE: The Echo Lake BASIC Enhancement*, has been introduced for the Commodore 64. The spreadsheet portion of *ELBE* is completely integrated into the computer's resident BASIC interpreter so the user can move back and forth between the computer's BASIC interpreter and the spreadsheet. The spreadsheet allows record-oriented data processing in BASIC and full and direct random access to disk files. It also can automatically right-adjust entries, line up decimal points, copy repeated data, and formulate a numeric keypad. *ELBE* lets you easily insert and delete records and sort the spreadsheet alphabetically or numerically.

ELBE also performs many of the traditional descriptive statistics such as computing median and mode, chi-squared tests, goodness-of-fit tests, analyses of variance and covariance, repeated-measures designs, mixed designs, correlation matrices, and multiple regressions. It can handle analysis of variance designs of up to 40 cells and some designs of over 200 cells. *ELBE* can even work with missing data and unequal cell sizes.

ELBE: The Echo Lake BASIC Enhancement is written in machine language. The program is copyrighted, but the disk is not copy-protected. A hardware key, which is provided with the software, is required to use *ELBE*.

Price is $49.95.

Echo Lake Laboratories, Box 169, Pasacoag, RI 02859-0169.

Circle Reader Service Number 205.

Hard Disk Drives

JCT has introduced three new hard disk drives for the Commodore 64 and 128. The JCT 1000, 1005, and 1010 contain 3.7, 5, and 10 megabytes of formatted capacity, respectively. All three disk drive packages feature an ST-506–compatible controller card, a Commodore-compatible interface card, interconnection cables, and a resident disk operating system. Each disk drive comes with power supply, A.C. power cord, fuse, fuse holder, and on/off switch.

Each package includes instructions for installation and operation, a five-year limited warranty on the drive, and a one-year warranty on all other hardware.

Suggested retail price for the JCT-1000 is $695, $795 for the JCT-1005, and $895 for the JCT-1010.

JCT, P.O. Box 286, Grants Pass, OR 97526.

Circle Reader Service Number 206.

Digital Sound Sampling

You can mix and store your own musical creations with Micro Arts' *Sampler-64* and *Com-Drum*. *Sampler-64* is a hardware/software package that lets you record, mix, add to, play back, and store any sounds on your Commodore 64 or 128 in 64 mode. It features a real-time input sequencer; echo, looping, and reverb effects; sample dubbing; sample block editing; and a two-octave range with the QWERTY keyboard.

The *Sampler-64* package includes a microphone, a cable to connect to your TV, and a ¼-inch jack to connect the sound output to an audio amplifier. The

hardware unit plugs into the user port of the Commodore 64 or 128. (The SID chip is not used in digital sound generation.) The menu-driven program comes on disk only and is not copy-protected.

Along with *Sampler-64*, you may wish to use *Com-Drum*, a software upgrade which adds three different eight-piece drum kits to your music. *Com-Drum* has a realtime sequencer for input and a step-time sequencer for editing. You can play up to three instruments simultaneously and store up to eight songs per disk. The prerecorded samplings feature Latin, rock, and miscellaneous drum kits.

Sampler-64 is sold for $89.95 plus $3.95 shipping and handling. *Com-Drum* costs $14.95 when bought with *Sampler-64* and $29.95 when bought alone. Both are sold by mail only. Pennsylvania residents must add 6 percent sales tax.

Micro Arts Products, P.O. Box 2522, Philadelphia, PA 19147.

Circle Reader Service Number 207.

Shakespeare On Disk

Macbeth, a new game from Avalon Hill, lets you take part in graphics-and-text adventures based on Shakespeare's tragedy, *Macbeth*. Four separate text adventures, two containing graphics, cover all the parts of the play. You can play the games as the young Macbeth, the older king defending his castle, Lady Macbeth plotting a murder, or the three witches preparing their famous brew.

Plus, each segment has a psychological program in which you try to discover what motivated the characters.

Macbeth includes the entire play from the 1623 *First Folio*, articles on the play, the play's history, and interpretations of characters.

Suggested retail price is $25 for the Commodore 64 and 128.

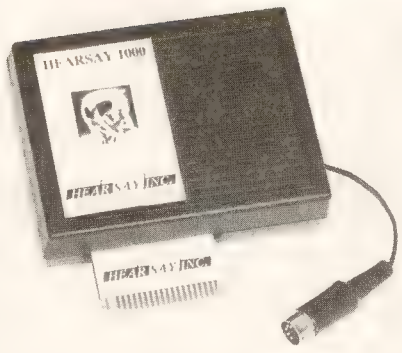
Avalon Hill Game Company, 4517 Harford Rd., Baltimore, MD 21214.

Circle Reader Service Number 208.

Make Your Commodore Talk

Hearsay has released a speech synthesizer/voice recognition add-on device and software packages that enable your Commodore 64 or 128 to talk and to respond to verbal commands. The Hearsay 1000 is a module that plugs into the rear port of the computer. It works with Hearsay software and many menu-driven third-party software packages already available.

The company has introduced a line of software for children, designed to help them learn basic skills on the computer through seeing and hearing. The Software for Children line includes *Rhyme and Reason*, a program which uses familiar nursery rhymes to teach



The Hearsay 1000 speech module for the Commodore 64 and 128.

the names of animals, names of clothing, parts of the body, seasons, safety, and other basics; *Aqua Circus*, which combines graphics, sound, and animation along with circus characters to teach shapes, colors, counting, numbers, and simple math; and *Think Bank*, a concentration game that helps the student learn addition, subtraction, multiplication, and division.

There's also a software program for adults. *Intelligent Talking Terminal* is a voice-activated telecommunications program. At your verbal command, the computer will automatically dial CompuServe, the police, or anyone else you designate. You can also view any information on the screen or print it out.

The Hearsay 1000 module retails for $79.95. Suggested retail price for *Rhyme and Reason, Aqua Circus, Think Bank*, or *Intelligent Talking Terminal* is $29.95 per program.

Hearsay, 1825 74th St., Brooklyn, NY 11204.

Circle Reader Service Number 209.

Database Manager For The Commodore 64/128

KnowledgeWare has announced a new text database manager for the Commodore 64 and 128. *Multifinder* comes with five applications—Refinder, for literature references; People and Places, a name, address, and mailing label file; Recipe Finder, for indexing recipes; Video Finder, for videocassettes; and Program Finder, to catalog software. You can also design your own applications.

The full-screen editor in *Multifinder* offers a field delete function, field memory which lets you display your previous entry, caps lock, and fast searching of up to four words or phrases. There is no fixed limit on the number of characters in a field, except that total characters in a record cannot exceed 248 in six fields. *Multifinder* holds up to 650 records on a disk.

THE ATARI TEN COMMANDMENTS # VI

"We shall create a computer that's as powerful in the music studio as it is in the office." Jack Tramiel

Atari was among the first in the personal computer business to do something for music.

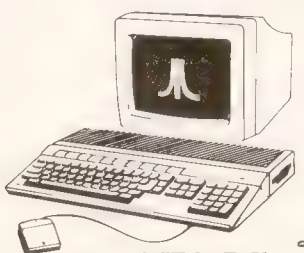
With a built-in Musical Instrument Digital Interface (MIDI), you can turn the 1040ST™ into a multitrack recording studio by connecting it directly to keyboards, drum machines, and synthesizers. No other PC has MIDI built in—not IBM®, not Amiga™, not Macintosh™.

The 16-bit ST™ also contains a sound chip with three programmable voices. One more reason why the ST Computer is at the top of the charts.

The ST is one of the finest 68000-based PC's you can own. It also features an array of expansion ports for your synthesizer, printer, and other important peripherals.

The 1040ST gives you all this for $999—which we think will be music to your ears.

Available at fine computer and music dealers.



ATARI®

© 1986 Atari Corp.
ATARI, ST & 1040ST are TM's or reg. TM's of Atari Corp. Amiga is a TM of Commodore-Amiga, Inc. IBM is a reg. TM of International Business Machines Corporation. Macintosh is a TM licensed to Apple Computer, Inc.

The active commands are displayed at the bottom of each screen display, and instructions are included with the program.

Multifinder will autoboot on the Commodore 128.

The price of *Multifinder* is $39.95. A demonstration disk is available for $2.

KnowledgeWare, 2013 N.E. 55th Blvd., Gainesville, FL 32601.

Circle Reader Service Number 210.

New IntelliCreations Games

IntelliCreations has announced two new games for the Commodore 64. *Gunslinger* is a graphics-and-text adventure game that takes place in the Old West. You are Kip Starr, the retired Texas Ranger, and you must rescue your friend, James Badland, from jail in a small Mexican town. On the way, you travel through a ghost town, explore a mine, battle hostile Indians, escape an enemy fort, and avoid the six Dalton Brothers who are out to get you. If you do finally rescue Badland, you still have to survive the confrontation with the Dalton Brothers at the OK Corral.

Gunslinger has a split-screen format with graphics in the upper left section, commands on the right, and text along the bottom of the screen. Play is controlled by either joystick or keyboard.

Theatre Europe is a war-simulation strategy game that deals with situations which could occur today or tomorrow, such as the first 30 days of a war in Europe between the Warsaw-Pact and NATO forces. You can command either the NATO forces or the Warsaw-Pact armies, which have invaded West Germany. The computer is the commander of the opposing forces. A map of Europe appears on the screen and you choose which battle you want to participate in.

There are three levels of play. Each higher level gives you less information and forces you to rely on your own strategy and expertise to avert war.

The retail price of *Theatre Europe* is $34.95; for *Gunslinger*, $29.95.

IntelliCreations, 19808 Nordhoff Place, Chatsworth, CA 91311.

Circle Reader Service Number 211.

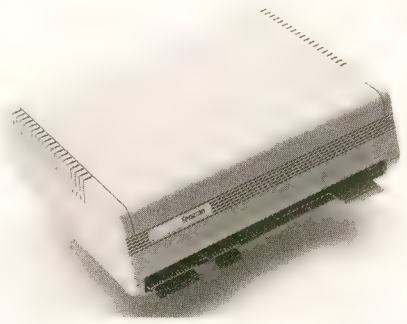
Apple II+ Emulator For The 64

The Spartan from Mimic Systems lets you run more than 95 percent of all Apple II+ software on your Commodore 64. It's a flexible, bus-oriented microcomputer system which is closely coupled to the 64. In addition to letting you run Apple II+ software, the Spartan allows you to add a variety of Apple peripherals and options like 80-column display cards, music synthesizers, and Z-80 and CP/M cards.

The price of the Spartan is $299.

Mimic Systems, 18027 Highway 99, Building A, Suite I, Lynnwood, WA 98037.

Circle Reader Service Number 212.



The Spartan ($299) is an Apple II+ emulator for the Commodore 64.

Outline Processor

Thoughtform, a full-featured outline processor written in machine language for the Commodore 64, lets you enter ideas and facts in any order and then arranges your data into logical order. It can handle headlines nested 200 levels deep and can expand or collapse headlines as needed. You can print all or any portion of the outline, or send it to a sequential file to be read by a word processor.

Thoughtform is meant to be user-distributed software, which means that registered owners can give away copies. When one of the users decides to buy the software from Thoughtform, the owner who distributed it receives a commission.

Thoughtform costs $35, and there's a 30-day guarantee on the purchase price.

Thoughtform, 45828 Emerson St., Hemet, CA 92344.

Circle Reader Service Number 213.

I/O Card For Commodore

Intelligent I/O has announced the release of its newest version of the BH100 General Purpose Input/Output Card for the Commodore 64 and VIC-20 computers. The card provides a total of eight 8-bit parallel ports (32 digital input lines and 32 digital and buffered output lines).

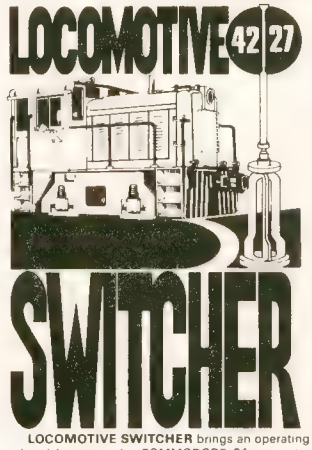
Since the ports are memory-mapped, data is sent or retrieved by the use of a single POKE or PEEK command. The BH100 manual includes instructions, sample programs (including simple subroutines for all I/O), and diagrams of typical hookups. And it's designed so that the user doesn't have to know any advanced programming techniques.

3 EXCITING COMPUTER SIMULATIONS from SIGNAL COMPUTER CONSULTANTS

Are available from SIGNAL COMPUTER CONSULTANTS, Ltd., P O. Box 18222, Dept. 11, Pittsburgh, PA 15236, or call (412) 655-7727. US and Canada add $2.50 postage and handling ($4.00 foreign) for each game ordered. PA residents include sales tax. Use Master Card, VISA, moneyorders or checks drawn on US or Canada banks. Master Card and Visa show card number, expiration date and signature. We guarantee and support our products. Free replacement or full refund for 30 day warranty period. Dealer inquiries invited

Created in response to feedback from users of the popular *TRAIN DISPATCHER* program, **SUPER DISPATCHER** is the most extensive CTC simulation on the market today for personal computers. Three completely different territories are provided along with new features such as fleeting, train reversing, control over clock speed, and complete randomization of dispatching situations. Programmed in assembly language, **SUPER DISPATCHER** provides for lightning-fast response to your commands as you route up to 60 trains over single, double and triple track territories.

Available for the Commodore 64 (disk only) at $35.00. Keyboard template and comprehensive instruction manual included.



LOCOMOTIVE SWITCHER brings an operating railroad layout to the COMMODORE 64 computer screen. The microlayout consists of mainline, six switches and seven loading areas. Sophisticated carmotion logic simulates train movements to a degree not possible on "real" model railroad layouts.

LOCOMOTIVE SWITCHER operates in two modes. As a FLAT YARD cars must be "spotted" at assigned loading docks – or pulled out to the mainline. In HUMP YARD mode the layout becomes a mini-classification yard. Operator performance is tracked and scored based on number of cars spotted, train moves, car damage and operating time.

For COMMODORE 64 (disk only) at $30.00. Manual and keyboard template included.

You never see the submarines. Rely on sonar sounds to track and attack evading enemy targets.

As commander of a group of three destroyers you must locate, pursue and sink a "Wolfpack" of 5 subs. Guided only by the realistic "pinging" of returning sonar echoes and bearing to target, **SONAR SEARCH** offers a unique and authentic simulation of WWII antisubmarine warfare.

Available for the Commodore 64 (disk only) at $15.00, plus postage and handling. Includes fully illustrated manual and keyboard template. Not recommended for children under 12.

COMPUTER MAIL ORDER

OUR GUIDE TO COMMODORE PRODUCTS

The Amiga™ System Package

System Includes: Amiga 1000 CPU, 256K RAM Expansion, Amiga 1080 RGB Hi-Res Monitor and...Amiga DOS, Basic, Tutorial, Kaleidoscope and Voice Sythesis Library.

$1199.00

Order No. CBGP

When you want to talk computers.
When you want to talk price.
Call toll-free: 1 800 233-8950.

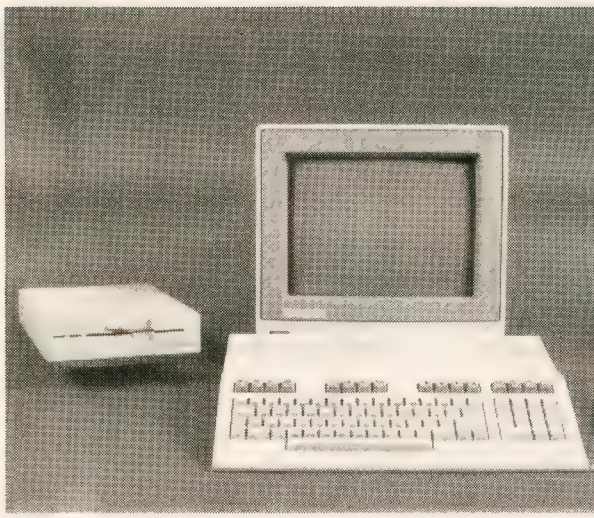
Outside the U.S.A. 717 327-9575 Telex 5106017898
CMO. 477 East Third Street, Dept. A412, Williamsport, PA 17701
All major credit cards accepted

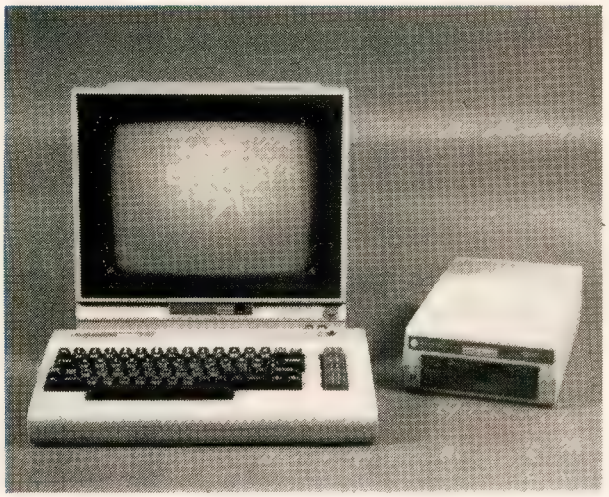
COMMODORE 128 SYSTEM PACKAGE

Complete system package includes: the Commodore 128 CPU with 128K (expandable to 512K), built-in Basic and 40/80 column display, the Commodore 1571, 5¼", disk drive featuring 350K capacity and built-in 6502 microprocessor, the Magnavox 8562 RGB/composite monitor with green text display switch...and ... diskettes with CP/M systems and utilities plus the 128 tutorial.

Order No. CB128P

$759.00



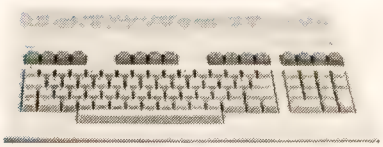


COMMODORE 64 SYSTEM PACKAGE

This complete system package includes: the Com modore 64 CPU with 64K and four programable func tion keys and a music synthesizer, 3-D graphics capability and sixteen text colors, the 1541, 5¼" disk dive featuring 170K capacity and built-in 6502 microprocessor, the Taxan 220 composite colo monitor with 14" screen, green and amber tex modes and audio.

Order No. CB64P

$479.00

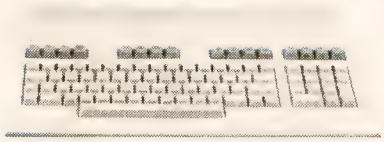


COMMODORE 64C

The new 64 with the Commodore 128 look includes: GEOS, GEOWRITE, GEOPAINT, AND QUANTUM LINK software. Now you can get the world's most popular computer in the newest style cabinet!

Order No. CB64C

$199.00



COMMODORE 128

The Commodore 128 is one of the most com prehensive computers on the market today. It standard 128K of memory is expandable to a incredible 512K.

Order No. CB128

$269.00

CMO COMPUTER MAIL ORDER

Call toll-free: 1 800 233-8950.

Outside the U.S.A. 717 327-9575 Telex 5106017898

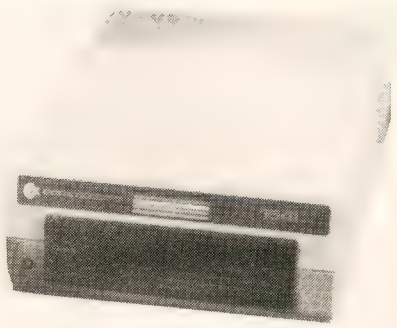
All major credit cards accepted

COMMODORE 1541 DISK DRIVE

The 1541 Disk Drive is an external 5¼'' floppy diskette recorder and player, offering high-speed and capacity for programs and data. It is an intelligent device, containing its own microprocessor, RAM, ROM, and operating systems software for faster speed of throughput and memory efficiency in the computer. It is read/write compatible with diskettes created on Commodore 4040 and 2031 disk drives. Interface cable for the Commodore 64 is included.

Order No. CB1541

$189.00



AMIGA 1010 3½'' DRIVE

Together, the internal Amiga drive and the 1010 external disk drive support a business environment with greater capacity and fast back-up capabilities.

Order No. CBG1010

$229.00

AMIGA 1020 5¼'' DRIVE

Expand your Amiga computer system and enjoy IBM® PC and Amiga disk drive compatibility with the 1020 5¼" floppy disk drive with a formatted capacity of 360K.

Order No. CBG1020

$199.00

COMMODORE 1571 DISK DRIVE

Commodore's newest design.With this 5¼" single floppy drive you can store up to 350K of information on a single diskette. Includes its own built-in 6502 microprocessor, 2K RAM, 32K ROM and transfer rates ranging from 300 cps (C64), to 41,360 cps (C128 and CP/M control). A must for all those important productivity applications.

Order No. CB1571

$249.00

CSI 10 Megabyte Hard Disk Drive for C64 and C128

This hi-tech drive is compatible with all Commodore computers. An intelligent peripheral device designed to use the serial or IEEE Commodore data transfer bus, it feature built-in backup mode, reformat protect, external device selectable and many more commands!

Order No. CMHD

$999.00

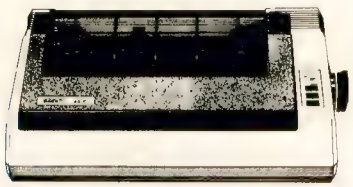
TECMAR 20MB HARD DRIVE

T-disk sits on your Amiga taking no valuable desk space to provide almost unlimited file capacity. A shielded cable connects T-disk to T-card's SASI port.

Order No. TCGTDISK

$859.00

STAR MICRONICS SG10C



120 cps dot matrix for the Commodore 64 and 64C. Includes interface and cable.

Order No. SGSG10C **$189.00**

EPSON HOMEWRITER 10

Features 100 cps and "select type". Choose NLQ, double strike, condensed or emphasized at the touch of a button.

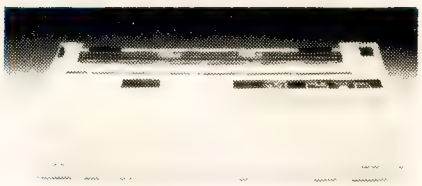
Order No. EPHW10 **$99.99**

EPSON LX86 D/M

120 cps draft, 16 NLQ and "select type". Allows selection of NLQ, double strike, condensed and emphasized at the touch of a button.

Order No. EPLX86 **$249.00**

OKIMATE 10



A thermal transfer printer featuring 60 cps. Uses black and white or color "clean hands" ribbons. Excellent for color graphics.

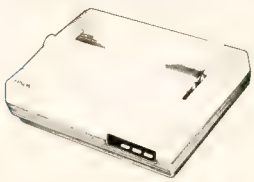
Order No. OKMATE10 **$139.00**

JUKI 6100

LQ daisywheel printer with 2K internal buffer, graphics capability, proportional spacing and the ability to print through 4 part forms.

Order No. JU6100 **$449.00**

EPSON DX 10



LQ daisywheel printer. Uses interchangable Diablo compatible printwheels. Features normal, bold, shadow and underline printing as well as superscript and subscript.

Order No. EPDX10 **$189.00**

ORANGE MICRO GRAPPLER CD

- Programming
- Spreadsheet
- Graphics
- Text

Order No. OMGCD **$89.99**

XETEC SUPER GRAPHICS

- Super Graphics
- C-64, C-128, Vic 20 Compatible
- 8K Buffer

Order No. XETEC8 **$69.99**

MICRO R & D MW350

- Full graphics interface
- C-64, C-128, C-16, Plus 4 and V-20 compatible
- Emulates CBM printers

Order No. MJ350CB **$49.99**

PPI BUFFER

- High speed graphics
- C-64, C-128, and V-20 compatible
- Emulates CBM printers
- NLQ feature

Order No. DAC01 **$39.99**

COMPUTER MAIL ORDER

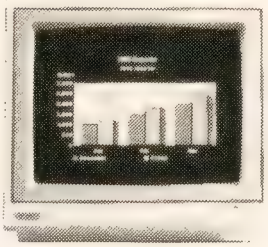
Call toll-free: 1 800 233-8950.

Outside the U.S.A. 717 327-9575 Telex 5106017898

All major credit cards accepted.

MAGNAVOX 515 COLOR MONITOR

The Magnavox 515 Monitor features: 14'' dark bulb tube, both composite and RGB modes offer 2000 characters 80 col x 25 lines at a resolution of 640 dots x 240 lines, green text display switch, built-in stand and audio input.

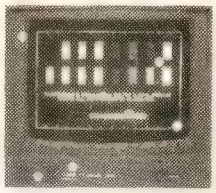


Order No. NAP515

$279.00

TEKNIKA MJ-22 COLOR MONITOR

13″ Hi-res RGB/composite color monitor featuring 16 true colors, four shades of grey and an 80 column mode. Capable of separated sound with a built-in speaker and amplifier right up front for best sound.



Order No. TKMJ22

$269.00

COMMODORE 1802 COLOR MONITOR

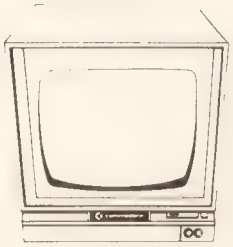
The Commodore 1802 composite monitor is the replacement for the 1702 monitor. It features 13'' screen, 40 col x 23 line display and audio.

Order No. CB1802

$189.00

COMMODORE 1902 COLOR MONITOR

This RGBI/composite monitor features a 13'' hi-res scrren with built-in audio amplifier and speaker. Comptible with C-128, C-64, C-4 + and C-16. Can be used with video cassette recorder or TV tuner.

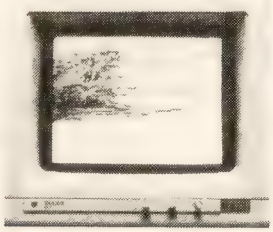


Order No. CB1902

$289.00

TAXAN 220 COMPOSITE MONITOR

Composite video with chroma and lumina imputs available for Commodore. Green or amber display, switchable and built-in audio.

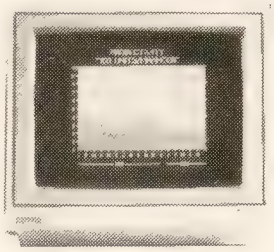


Order No. TAC210

$169.00

MAGNAVOX 505 COLOR MONITOR

14″ RGB/Composite color monitor with RGB TTL, RGB Analog and composite inputs. Green text display switch. 390 X 240 resolution.



Order No. NAP505

$169.00

TURN YOUR MONITOR INTO A TELEVISION

Your monitor will become a superb TV with the addition of a Magnavox 82 Channel TV Tuner with both UHF and VHF capability.

Order No. NAP7300

$39.99

COMPUTER MAIL ORDER

Call toll-free: 1 800 233-8950.

Outside the U.S.A. 717 327-9575 Telex 5106017898

All major credit cards accepted.

MODEMS

ANCHOR VOLKSMODEM 12

300/1200 Baud for C-64, C128, SX64, V20, Amiga
Auto Answer - Auto Dial
Voice/Data Switch

Order No. ANVM12 — $129.00

ANCHOR 6480

300/1200 Baud for C-64, C128
Auto Answer - Auto Dial
Autocom 64 and 128 Software Included

Order No. AN6480 — $119.00

VOLKSMODEM 6420

300 Baud for C-64, V20
Auto Answer - Auto Dial
Autocom IV Software Included

Order No. AN6420 — $69.99

SUPRA SJ 1064

300 Baud for C-64
Auto Answer - Auto Dial
VIP Smart Term Software Included

Order No. SJ1064 — $49.99

COMMODORE 1660

300 Baud for C-64, C128, SX64, V20
Auto Answer - Auto Dial
Includes Terminal Software

Order No. CB1660 — $59.99

COMMODORE 1670

300/1200 Baud for C-64, C128, SX64, V20
Auto Answer - Auto Dial
Hayes Command Protocol
Includes Terminal Software

Order No. CB1670 — $169.00

COMMODORE 1680

300/1200 Baud for the Amiga
Auto Answer - Auto Dial
Hayes Command Protocol
Includes Terminal Software

Order No. CBG1680 — $229.00

TELELEARNING 300B

300 Baud for C-64
Auto Answer - Auto Dial
Includes Connect Time Clock

Order No. TD400 — $39.99

DISKETTES & ACCESSORIES

MAXELL DISKETTES
5¼" MD-2 DS/DD (10) $14.99
3½" SS/SD (10) $18.99

SONY DISKETTES
3½" DS/DD 5 Pak $9.99
5¼" SS/DD 10 Pak $9.99

AMARAY DISK TUBS
30 Disk Tub 3½" $9.99
50 Disk Tub 5¼" $9.99
100 Disk Tub 5¼" $19.99

CURTIS ACCESSORIES
Safety Strip w/6 outlets $19.99
SP2 Surge and Spike Supressor $39.99
Universal Printer Stand $14.99

COMPUTER SPECIALTIES
Power Supply + 3 outlet surge protection for C64 ..... $54.99

PICO PRODUCTS
Tilt/Swivel Monitor Base with Power Command Center .. $59.99

INNOVATIVE CONCEPTS
Flip N' File 10 Disk Holder $2.49
Flip N' File 50 Disk Holder $11.49

JOYSTICKS
Spectra Quickshot I $6.99
Spectra Quickshot IV $12.99

BIB
5¼" Drive Head Cleaner $4.99
3½" Drive Head Cleaner $14.99

COMPUTER MAIL ORDER

Call toll-free: 1 800 233-8950.
Outside the U.S.A. 717 327-9575 Telex 5106017898

All major credit cards accepted.

SOFTWARE FOR C-64/C-128

BRODERBUND

Order No. BBC95D
PRINT SHOP 29.99
Order No. BBC655
MUSIC SHOP 29.99
Order No. BBC97D
GRAPHICS LIBRARY I 17.99
Order No. BBC820
BANK ST. WRITER 29.99
Order No. BBC98
GRAPHICS LIBRARY II 17.99
Order No. BBC99
GRAPHICS LIBRARY III 17.99

BATTERIES INCLUDED

Order No. BIC1010
PAPERCLIP w/Spellpack 49.99
Order No. BIC1020
SPELLPACK 29.99
Order No. BIC2000
CONSULTANT 37.99
Order No. BIC4000
HOMEPACK 29.99

Continental Software

Order No. CTA05
HOME ACCOUNTANT 44.99
Order No. CTA06
TAX ADVANTAGE '85 ..... 39.99

Central Point Software

Order No.
COPY II BACK-UP 29.99

ELECTRONIC ARTS

Order No. EAC05D
ONE ONE ONE 26.99
Order No. EAC14D
MOVIE MAKER 24.99
Order No. EAC10D
Music Construction Set 17.99

EPYX

Order No. EXC01D
FASTLOAD 31.99

MINDSCAPE

Order No. MDC01
TINK'S ADVENTURE 9.99
Order No. MDC04
TINKA'S MAZES 9.99
Order No. MDC02
LAND OF BUDDY BOTS 9.99
Order No. MDC03
TUK GOES TO TOWN 9.99
Order No. MDC04
HALLEY PROJECT 29.99
Order No. MDC05
CROSSWORD MAGIC 34.99

MICROPROSE

Order No. MPC02
AEROJET 24.99
Order No. MPC03
TOP SECRET 24.99
Order No. MPC01
KENNEDY APPROACH 24.99

Professional Software

Order No. PSCFS
FLEET SYSTEMS II 49.99

Software Publishing

Order No. PFC01
PFS-FILE 39.99

SPRINGBOARD

Order No. SBC01
NEWSROOM 34.99
Order No. SBC02
CLIP ARTS 22.99

SUB LOGIC

Order No. SUC1
FLIGHT SIMULATOR II 37.99
Order No. SUC2
JET 37.99

SOFTWARE FOR AMIGA

ACTIVISION

Order No. CB9AV01
HACKER 34.99
Order No. CB9AV02
MIND SHADOW 34.99
Order No. CB9AV03
BORROWED TIME 32.99

COMMODORE

Order No. CB9CB01
TEXTCRAFT 59.99
Order No. CB9CB02
GRAPHIC CRAFT 39.99
Order No. CB9CB03
AMIGA TERM EMULATOR 39.99
Order No. CB9CB04
TLC LOGO 79.99
Order No. CB9CB05
AMIGA PASCAL 79.99
Order No. CB9CB06
AMIGA LATTICE C 119.00
Order No. CB9CB07
AMIGA ASSEMBLER 79.99
Order No. CB9CB08
LISP 156.00
Order No. CB9CB09
DOS MANUAL 19.99
Order No. CB9CB10
TECH DOCUMENTS 79.99
Order No. CB9CB11
MINDWALKER 39.99

DISCOVERY

Order No. CB9DV01
MARAUDER/BACKUP 32.99

ELECTRONIC ARTS

Order No. CB9EA01
DELUXE PAINT 64.99
Order No. CB9EA02
ARCHON 31.99
Order No. CB9EA03
ONE ON ONE 31.99
Order No. CB9EA04
SKYFOX 31.99
Order No. CB9EA05
FINANCIAL COOKBOOK 39.99
Order No. CB9EA06
ARTIC FOX 31.99
Order No. CB9EA07
7 CITIES OF GOLD 32.99
Order No. CB9EA08
DELUXE PRINT 74.99
Order No. CB9EA09
DELUXE VIDEO 69.99
Order No. CB9EA10
INSTANT MUSIC 34.99

MEGASOFT

Order No. CB9MG01
A-COPIER 34.99
Order No. CB9MG02
A-REPORT 44.99

INFOCOM

Order No. CB9IF01
WISHBRINGER 32.99
Order No. CB9IF02
HITCHHIKER 32.99
Order No. CB9IF03
SPELLBREAKER 32.99
Order No. CB9IF04
PLANETFALL 32.99
Order No. CB9IF05
WITNESS 32.99

MICRO SYSTEMS

Order No. CB9MS01
ANALYZE 79.99
Order No. CB9MS02
SCRIBBLE 79.99
Order No. CB9MS03
ON LINE COMMUNICATIONS 59.99
Order No. CB9MS04
ORGANIZE DATA BASE 79.99
Order No. CB9MS05
ANALYZE (Version 2.0) 119.00

MINDSCAPE

Order No. CB9MD01
HALLEY PROJECT 34.99
Order No. CB9MD02
DEJA VU 34.99
Order No. CB9MD03
KEYBOARD CADET 29.99

COMPUTER MAIL ORDER

Call toll-free: 1 800 233-8950.

Outside the U.S.A. 717 327-9575 Telex 5106017898

All major credit cards accepted.

BUSH COMPUTER DESK

The perfect work station for home or office. Quality components shipped ready for easy assembly. Specific step-by-step instructions are included.

Order No. BU130

$99.99

EPSON HOMEWRITER 10

- "Select Type": NLQ, double strike, condensed or emphasized, at the touch of a button.
- 100 CPS

Order No. EPHW10

$99.99

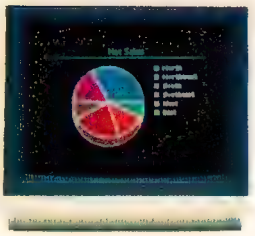
CASSETTE DATA RECORDER

- For C-64, C-128,, V-20
- Battery or AC operation
- AC adapter included

Order No. CB1530

$39.99

MAGNAVOX 8502 COLOR MONITOR



- 13" Composite color
- 330 X 350 Resolution
- Green text switch

Order No. NAP8502

$159.00

CMO. Policies and particulars.

Next day shipping on all in-stock items. • Free technical support from our own factory-trained staff. • Toll-free order inquiry. • No surcharge on VISA or MasterCard orders. • Credit cards will not be charged until the order is shipped. • No limit and no deposit on COD orders. • No sales tax on orders shipped outside PA. • No waiting period for cashier's checks.

SHIPPING. Add 3% (minimum $7.00) shipping and handling on all orders. • Larger shipments may require additional charges. • Returned items may be subject to a restocking fee. • All items subject to availability and price changes.

EDUCATIONAL INSTITUTIONS: 1 800 221-4283

When you want to talk computers. When you want to talk price. Call toll-free: 1 800 233-8950.

Outside the U.S.A. 717 327-9575 Telex 5106017898
CMO. 477 East Third Street, Dept. A412, Williamsport, PA 17701
All major credit cards accepted

The suggested price is $129.

The company is also introducing the Complete Beginner's I/O Interface Course, an introductory course on computer interfacing. The complete course retails for $159 and includes the BH100 I/O interface, a beginner's module, and an illustrated course manual. The manual can also be purchased separately for $15.

Intelligent I/O, P.O. Box 70, Potsdam, NY 13676.

Circle Reader Service Number 214.

Bulletin Board System Software

Blue Board, from SOTA Computing Systems, is a BBS program for the Commodore 64. It supports over 200 online messages (up to 1023 characters each), up to 220 users, and over 25 SYSOP-definable sub-boards. The software is written entirely in machine language and employs highly optimized disk driver routines, making it a very fast system.

Other features of the board include remote SYSOP access, a private SYSOP sub-board, and unlimited session connect time. Each of these features is password-protected for system security. *Blue Board* also features "scribbles," mini sub-boards where messages of 80 characters or less may be used for opinion forums, voting, chess games, or other applications. The system has been designed to provide the SYSOP with total system control. Suggested retail price is $69.95.

SOTA Computing Systems Ltd., 213-1080 Broughton St., Vancouver, B.C., Canada V6G 2A8.

Circle Reader Service Number 215.

New Commodore-Compatible Printer

Star Micronics has introduced the NX-10C Commodore-compatible printer, with NLQ (near-letter-quality) and draft modes. The printer connects directly to the Commodore 64 and 128 computers through a built-in Commodore serial interface. Speeds range from 120 characters per second (cps) for draft output to 30 cps for NLQ type.

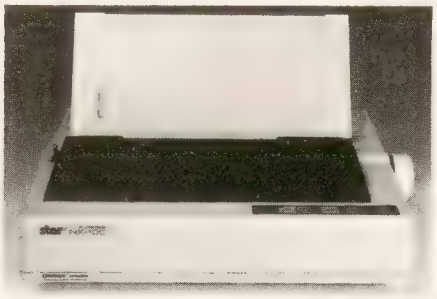
Front-panel controls on the NX-10C make the printer easier to use, and there's fingertip selection of draft or NLQ modes, typeface and print pitch, and margin settings and form alignment as well. Flipping the automatic-paper-feed lever feeds single sheets into position for printing on whatever line you designate. An adjustable rear tractor feed, as well as friction feed, are standard features that allow for either fanfold or cut-sheet paper printing. In addition, preprinted forms can be aligned by adjusting the forward and reverse micro feed.

The NX-10C has its own built-in character set, offering upper- and lowercase letters, numbers, and symbols in NLQ mode with the addition of block graphics in high-speed draft mode. Full Commodore MPS-803 emulation allows graphics to be integrated into the printing. The printer is bidirectional; also, logic seeking is a standard feature of the NX-10C. The printer comes with a snap-in ribbon cassette.

The suggested retail price for the NX-10C is $349.

Star Micronics, 200 Park Ave., Suite 3510, New York, NY 10166.

Circle Reader Service Number 216.



The Star Micronics NX-10C is a new Commodore-compatible dot-matrix printer.

General Ledger Program

Bookkeeper-64 from Datacount Software is a single-entry general ledger program for home or small business use. This software for the Commodore 64 incorporates a chart of accounts, transaction register, and income statement. The displays are menu-driven, and the reports can be printed out for permanent record.

Two additional programs are included in the package. *List-64* is a list processing program with up to ten fields in each file. *Biorhythm-64* produces a biorhythm chart and a list of critical days.

Bookkeeper-64 is available for $19.95 plus $2 shipping and handling. California residents should add 6% sales tax.

Datacount Software, P.O. Box 1679, Coronado, CA 92118.

Circle Reader Service Number 217.

SpeedScript Customization

Speedmate is a customization program for the *SpeedScript* word processor (versions 3.0–3.2) that lets you set the defaults you prefer and control the way text appears on the screen while editing. *Speedmate* includes an optional print preview routine which displays 80 columns of text onscreen at once with no horizontal scrolling. *Speedmate* also customizes COMPUTE!'s *Preview-80* control commands for one-hand operation. (*SpeedScript* and *Preview-80* are products of COMPUTE! Publications and are not included with *Speedmate*.)

The program lets you set and save defaults for right, left, top, and bottom margins; page length; spacing; continuous or single-sheet paper; first and starting page numbers; page width (for centering); and more than 35 predefined printer code defaults, as well as screen and letter colors, among other features.

Speedmate is available for $15 (outside US and Canada, add $2 per disk; North Carolina residents add 5% sales tax).

Upstart Publishing, Dept. NPGM, P.O. Box 22022, Greensboro, NC 27420.

Circle Reader Service Number 218.

128 Software From Abacus

Three new productivity software packages for the Commodore 128 are now available from Abacus. *SpeedTerm 128* is a flexible, command-driven terminal software package that supports most modems for the 128. It contains the standard options found in most terminal software; plus *SpeedTerm 128* supports Xmodem and Punter file-transfer protocols and VT52 and VT100 terminal emulation with cursor keys. It has a 45K capture buffer and user-definable function keys.

TAS-128 is a technical analysis system for stock market charting. With *TAS-128*, you can download indicators from DNJ/RS or Warner and then create a variety of charts on the split screen using seven moving averages, three oscillators, five volume indicators, comparison charts, trading bands, and least squares. It also has macro capabilities, automatic and unattended log-on, and fast draw charts using up to four windows.

Abacus has upgraded the *Personal Portfolio Manager* for the 128. *PPM-128* tracks the performance of stocks, bonds, options, or profits and losses. It also has very complete reporting capabilities.

SpeedTerm 1128, *TAS-128*, and *PPM-128* all retail for $59.95 each.

Abacus Software, 2201, Kalamazoo SE, P.O. Box 7211, Grand Rapids, MI 49510.

Circle Reader Service Number 219.

COMPUTE!'s GAZETTE
TOLL FREE
Subscription Order Line
1-800-247-5470
In IA 1-800-532-1272

COMPUTE!'s GAZETTE Author's Guide

Here are some suggestions which serve to improve the speed and accuracy of publication for prospective authors. COMPUTE!'s GAZETTE is primarily interested in new and timely articles on the Commodore 128, 64, Plus/4, and 16. We are much more concerned with the content of an article than with its style, but articles should as be clear and well-explained as possible.

The guidelines below will permit your good ideas and programs to be more easily edited and published:

1. The upper left corner of the first page should contain your name, address, telephone number, and the date of submission.

2. The following information should appear in the upper right corner of the first page. If your article is specifically directed to one model of computer, please state the model name. In addition, *please indicate the memory requirements of programs.*

3. The underlined title of the article should start about 2/3 of the way down the first page.

4. Following pages should be typed normally, except that in the upper right corner there should be an abbreviation of the title, your last name, and the page number. For example: Memory Map/Smith/2.

5. All lines within the text of the article must be double- or triple-spaced. A one-inch margin should be left at the right, left, top, and bottom of each page. No words should be divided at the ends of lines. And please do not justify. Leave the lines ragged.

6. Standard typing or computer paper should be used (no erasable, onionskin, or other thin paper) and typing should be on one side of the paper only (upper- and lowercase).

7. Sheets should be attached together with a paper clip. Staples should not be used.

8. If you are submitting more than one article, send each one in a separate mailer with its own tape or disk.

9. Short programs (under 20 lines) can easily be included within the text. Longer programs should be separate listings. *It is essential that we have a copy of the program, recorded twice, on a tape or disk.* If your article was written with a word processor, we also appreciate a copy of the text file on the tape or disk. Please use high-quality 10 or 30 minute tapes with the program recorded on both sides. The tape or disk should be labeled with the author's name and the title of the article. Tapes are fairly sturdy, but disks need to be enclosed within plastic or cardboard mailers (available at photography, stationery, or computer supply stores).

10. A good general rule is to spell out the numbers zero through ten in your article and write higher numbers as numerals (1024). The exceptions to this are: Figure 5, Table 3, TAB(4), etc. Within ordinary text, however, the zero through ten should appear as words, not numbers. Also, symbols and abbreviations should not be used within text: use "and" (not &), "reference" (not ref.), "through" (not thru).

11. For greater clarity, use all capitals when referring to keys (RETURN, CTRL, SHIFT), BASIC words (LIST, RND, GOTO), and the language BASIC. Headlines and subheads should, however, be initial caps only, and emphasized words are not capitalized. If you wish to emphasize, underline the word and it will be italicized during typesetting.

12. Articles can be of any length—from a single-line routine to a multi-issue series. The average article is about four to eight double-spaced, typed pages.

13. If you want to include photographs, they should be either 5×7 black and white glossies or color slides.

14. We do not consider articles which are submitted simultaneously to other publishers. If you wish to send an article to another magazine for consideration, please do not submit it to us.

15. COMPUTE!'s GAZETTE pays between $70 and $800 for published articles. In general, the rate reflects the length and quality of the article. Payment is made upon acceptance. Following submission (Editorial Department, COMPUTE!'s GAZETTE, P.O. Box 5406, Greensboro, NC 27403) it will take from two to four weeks for us to reply. If your work is accepted, you will be notified by a letter which will include a contract for you to sign and return. *Rejected manuscripts are returned to authors who enclose a self-addressed, stamped envelope.*

16. If your article is accepted and you have since made improvements to the program, please submit an entirely new tape or disk and a new copy of the article reflecting the update. We cannot easily make revisions to programs and articles. It is necessary that you send the revised version as if it were a new submission entirely, but be sure to indicate that your submission is a revised version by writing, "Revision" on the envelope and the article.

17. COMPUTE!'s GAZETTE does not accept unsolicited product reviews. If you are interested in serving on our panel of reviewers, contact our Features Editor for details.

How To Type In *COMPUTE!'s GAZETTE* Programs

Each month, COMPUTE!'s GAZETTE publishes programs for the Commodore 128, 64, Plus/4, 16, and VIC-20. Each program is clearly marked by title and version. Be sure to type in the correct version for your machine. All 64 programs run on the 128 in 64 mode. Be sure to read the instructions in the corresponding article. This can save time and eliminate any questions which might arise after you begin typing.

We frequently publish two programs designed to make typing easier: The Automatic Proofreader, and MLX, designed for entering machine language programs.

When entering a BASIC program, be especially careful with DATA statements as they are extremely sensitive to errors. A mistyped number in a DATA statement can cause your machine to "lock up" (you'll have no control over the computer). If this happens, the only recourse is to turn your computer off then back on, erasing whatever was in memory. So be sure to *save a copy of your program before you run it.* If your computer crashes, you can always reload the program and look for the error.

Special Characters

Most of the programs listed in each issue contain special control characters. To facilitate typing in any programs from the GAZETTE, use the following listing conventions.

The most common type of control characters in our listings appear as words within braces: {DOWN} means to press the cursor down key; {5 SPACES} means to press the space bar five times.

To indicate that a key should be *shifted* (hold down the SHIFT key while pressing another key), the character is underlined. For example, A means hold down the SHIFT key and press A. You may see strange characters on your screen, but that's to be expected. If you find a number followed by an underlined key enclosed in braces (for example, {8 A}), type the key as many times as indicated (in our example, enter eight SHIFTed A's).

If a key is enclosed in special brackets, [ ], hold down the Commodore key (at the lower left corner of the keyboard) and press the indicated character.

Rarely, you'll see a single letter of the alphabet enclosed in braces. This can be entered on the Commodore 64 by pressing the CTRL key while typing the letter in braces. For example, {A} means to press CTRL-A.

The Quote Mode

Although you can move the cursor around the screen with the CRSR keys, often a programmer will want to move the cursor under program control. This is seen in examples such as {LEFT} and {HOME} in the program listings. The only way the computer can tell the difference between direct and programmed cursor control is *the quote mode.*

Once you press the quote key, you're in quote mode. This mode can be confusing if you mistype a character and cursor left to change it. You'll see a reverse video character (a graphics symbol for cursor left). In this case, you can use the DELete key to back up and edit the line. Type another quote and you're out of quote mode. If things really get confusing, you can exit quote mode simply by pressing RETURN. Then just cursor up to the mistyped line and fix it.

When You Read:	Press:	See:
{CLR}	SHIFT + CLR/HOME	
{HOME}	CLR/HOME	
{UP}	SHIFT + ↑ CRSR ↓	
{DOWN}	↑ CRSR ↓	
{LEFT}	SHIFT + ← CRSR →	
{RIGHT}	← CRSR →	
{RVS}	CTRL + 9	
{OFF}	CTRL + 0	
{BLK}	CTRL + 1	
{WHT}	CTRL + 2	
{RED}	CTRL + 3	
{CYN}	CTRL + 4	

When You Read:	Press:	See:
{PUR}	CTRL + 5	
{GRN}	CTRL + 6	
{BLU}	CTRL + 7	
{YEL}	CTRL + 8	
{ F1 }	f1	
{ F2 }	SHIFT + f1	
{ F3 }	f3	
{ F4 }	SHIFT + f3	
{ F5 }	f5	
{ F6 }	SHIFT + f5	
{ F7 }	f7	
{ F8 }	SHIFT + f7	

When You Read:	Press:	See:
←	←	
↑	SHIFT + ↑	

For Commodore 64 Only

[1]	COMMODORE + 1	
[2]	COMMODORE + 2	
[3]	COMMODORE + 3	
[4]	COMMODORE + 4	
[5]	COMMODORE + 5	
[6]	COMMODORE + 6	
[7]	COMMODORE + 7	
[8]	COMMODORE + 8	

The Automatic Proofreader

Philip I. Nelson, Assistant Editor

"The Automatic Proofreader" helps you type in program listings for the 128, 64, Plus/4, 16, and VIC-20 and prevents nearly every kind of typing mistake.

Type in the Proofreader *exactly* as listed. Since the program can't check itself, type carefully to avoid mistakes. Don't omit any lines, even if they contain unfamiliar commands. After finishing, save a copy or two on disk or tape before running it. This is important because the Proofreader erases the BASIC portion of itself when you run it, leaving only the machine language portion in memory.

Next, type RUN and press RETURN. After announcing which computer it's running on, the Proofreader displays the message "Proofreader Active". Now you're ready to type in a BASIC program.

Every time you finish typing a line and press RETURN, the Proofreader displays a two-letter checksum in the upper-left corner of the screen. Compare this result with the two-letter checksum printed to the left of the line in the program listing. If the letters match, it's almost certain the line was typed correctly. If the letters don't match, check for your mistake and correct the line.

The Proofreader ignores spaces not enclosed in quotes, so you can omit or add spaces between keywords and still see a matching checksum. However, since spaces inside quotes are almost always significant, the Proofreader pays attention to them. For example, **10 PRINT"THIS IS BASIC"** will generate a different checksum than **10 PRINT"THIS ISBA SIC"**.

A common typing error is transposition—typing two successive characters in the wrong order, like PIRNT instead of PRINT or 64378 instead of 64738. The Proofreader is sensitive to the *position* of each character within the line and thus catches transposition errors.

The Proofreader does *not* accept keyword abbreviations (for example, ? instead of PRINT). If you prefer to use abbreviations, you can still check the line by LISTing it after typing it in, moving the cursor back to the line, and pressing RETURN. LISTing the line substitutes the full keyword for the abbreviation and allows the Proofreader to work properly. The same technique works for rechecking programs you've already typed in.

If you're using the Proofreader on the Commodore 128, Plus/4, or 16, *do not perform any GRAPHIC commands while the Proofreader is active.* When you perform a command like GRAPHIC 1, the computer moves everything at the start of BASIC program space—including the Proofreader—to another memory area, causing the Proofreader to crash. The same thing happens if you *run* any program with a GRAPHIC command while the Proofreader is in memory.

Though the Proofreader doesn't interfere with other BASIC operations, it's a good idea to disable it before running another program. However, the Proofreader is purposely difficult to dislodge: It's not affected by tape or disk operations, or by pressing RUN/STOP– RESTORE. The simplest way to disable it is to turn the computer off then on. A gentler method is to SYS to the computer's built-in reset routine (SYS 65341 for the 128, 64738 for the 64, 65526 for the Plus/4 and 16, and 64802 for the VIC). These reset routines erase any program in memory, so be sure to save the program you're typing in before entering the SYS command.

If you own a Commodore 64, you may already have wondered whether the Proofreader works with other programming utilities like "MetaBASIC." The answer is generally yes, *if you're using a 64 and activate the Proofreader after installing the other utility.* For example, first load and activate MetaBASIC, then load and run the Proofreader.

When using the Proofreader with another utility, you should disable *both* programs before running a BASIC program. While the Proofreader seems unaffected by most utilities, there's no way to promise that it will work with any and every combination of utilities you might want to use. The more utilities activated, the more fragile the system becomes.

The New Automatic Proofreader

```
10 VEC=PEEK(772)+256*PEEK(773)
   :LO=43:HI=44
20 PRINT "AUTOMATIC PROOFREADE
   R FOR ";:IF VEC=42364 THEN
   {SPACE}PRINT "C-64"
30 IF VEC=50556 THEN PRINT "VI
   C-20"
40 IF VEC=35158 THEN GRAPHIC C
   LR:PRINT "PLUS/4 & 16"
50 IF VEC=17165 THEN LO=45:HI=
   46:GRAPHIC CLR:PRINT"128"
60 SA=(PEEK(LO)+256*PEEK(HI))+
   6:ADR=SA
70 FOR J=0 TO 166:READ BYT:POK
   E ADR,BYT:ADR=ADR+1:CHK=CHK
   +BYT:NEXT
80 IF CHK<>20570 THEN PRINT "*
   ERROR* CHECK TYPING IN DATA
    STATEMENTS":END
90 FOR J=1 TO 5:READ RF,LF,HF:
   RS=SA+RF:HB=INT(RS/256):LB=
   RS-(256*HB)
100 CHK=CHK+RF+LF+HF:POKE SA+L
   F,LB:POKE SA+HF,HB:NEXT
110 IF CHK<>22054 THEN PRINT "
   *ERROR* RELOAD PROGRAM AND
   {SPACE}CHECK FINAL LINE":EN
   D
120 POKE SA+149,PEEK(772):POKE
    SA+150,PEEK(773)
130 IF VEC=17165 THEN POKE SA+
   14,22:POKE SA+18,23:POKESA+
   29,224:POKESA+139,224
140 PRINT CHR$(147);CHR$(17);"
   PROOFREADER ACTIVE":SYS SA
150 POKE HI,PEEK(HI)+1:POKE (P
   EEK(LO)+256*PEEK(HI))-1,0:N
   EW
160 DATA 120,169,73,141,4,3,16
   9,3,141,5,3
170 DATA 88,96,165,20,133,167,
   165,21,133,168,169
180 DATA 0,141,0,255,162,31,18
   1,199,157,227,3
190 DATA 202,16,248,169,19,32,
   210,255,169,18,32
200 DATA 210,255,160,0,132,180
   ,132,176,136,230,180
210 DATA 200,185,0,2,240,46,20
   1,34,208,8,72
220 DATA 165,176,73,255,133,17
   6,104,72,201,32,208
230 DATA 7,165,176,208,3,104,2
   08,226,104,166,180
240 DATA 24,165,167,121,0,2,13
   3,167,165,168,105
250 DATA 0,133,168,202,208,239
   ,240,202,165,167,69
260 DATA 168,72,41,15,168,185,
   211,3,32,210,255
270 DATA 104,74,74,74,74,168,1
   85,211,3,32,210
280 DATA 255,162,31,189,227,3,
   149,199,202,16,248
290 DATA 169,146,32,210,255,76
   ,86,137,65,66,67
300 DATA 68,69,70,71,72,74,75,
   77,80,81,82,83,88
310 DATA 13,2,7,167,31,32,151,
   116,117,151,128,129,167,136
   ,137
```

MLX Machine Language Entry Program For Commodore 64 and 128

Ottis R. Cowper, Technical Editor

"MLX" is a labor-saving utility that allows almost fail-safe entry of machine language programs. Included are versions for the Commodore 64 and 128.

Type in and save some copies of whichever version of MLX is appropriate for your computer (you'll want to use it to enter future ML programs from COMPUTE!'s GAZETTE). Program 1 is for the Commodore 64, and Program 2 is for the 128 (128 MLX can also be used to enter Commodore 64 ML programs for use in 64 mode). When you're ready to enter an ML program, load and run MLX. It asks you for a starting address and an ending address. These addresses appear in the article accompanying the MLX-format program listing you're typing.

If you're unfamiliar with machine language, the addresses (and all other values you enter in MLX) may appear strange. Instead of the usual decimal numbers you're accustomed to, these numbers are in *hexadecimal*—a base 16 numbering system commonly used by ML programmers. Hexadecimal—hex for short—includes the numerals 0–9 and the letters A–F. But don't worry—even if you know nothing about ML or hex, you should have no trouble using MLX.

After you enter the starting and ending addresses, you'll be offered the option of clearing the workspace. Choose this option if you're starting to enter a new listing. If you're continuing a listing that's partially typed from a previous session, don't choose this option.

A functions menu will appear. The first option in the menu is ENTER DATA. If you're just starting to type in a program, pick this. Press the E key, and type the first number in the first line of the program listing. If you've already typed in part of a program, type the line number where you left off typing at the end of the previous session (be sure to load the partially completed program before you resume entry). In any case, make sure the address you enter corresponds to the address of a line in the listing you are entering. Otherwise, you'll be unable to enter the data correctly. If you pressed E by mistake, you can return to the command menu by pressing RETURN alone when asked for the address. (You can get back to the menu from most options by pressing RETURN with no other input.)

Entering A Listing

Once you're in Enter mode, MLX prints the address for each program line for you. You then type in all nine numbers on that line, beginning with the first two-digit number after the colon (:). Each line represents eight data bytes and a checksum. Although an MLX-format listing appears similar to the "hex dump" listings from a machine language monitor program, the extra checksum number on the end allows MLX to check your typing. (Commodore 128 users *can* enter the data from an MLX listing using the built-in monitor if the rightmost column of data is omitted, but we recommend against it. It's much easier to let MLX do the proofreading and error checking for you.)

When you enter a line, MLX recalculates the checksum from the eight bytes and the address and compares this value to the number from the ninth column. If the values match, you'll hear a bell tone, the data will be added to the workspace area, and the prompt for the next line of data will appear. But if MLX detects a typing error, you'll hear a low buzz and see an error message. The line will then be redisplayed for editing.

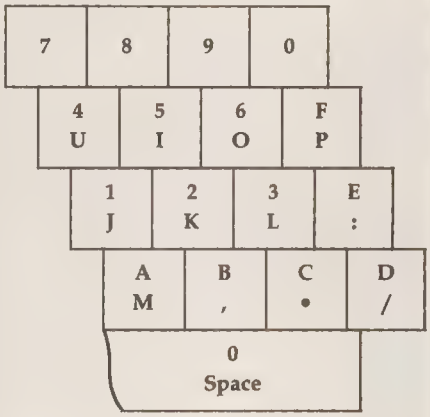
Invalid Characters Banned

Only a few keys are active while you're entering data, so you may have to unlearn some habits. You *do not* type spaces between the columns; MLX automatically inserts these for you. You *do not* press RETURN after typing the last number in a line; MLX automatically enters and checks the line after you type the last digit.

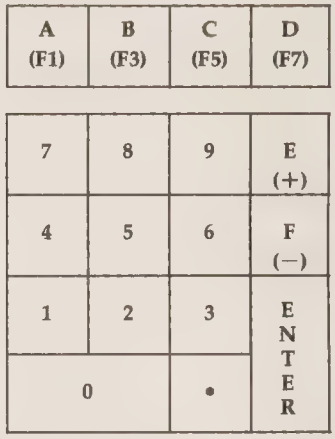
Only the numerals 0–9 and the letters A–F can be typed in. If you press any other key (with some exceptions noted below), you'll hear a warning buzz. To simplify typing, 128 MLX redefines the function keys and + and − keys on the numeric keypad so that you can enter data one-handed. (The 64 version incorporates the keypad modification from the March 1986 "Bug-Swatter" column, lines 485–487.) In either case, the keypad is active only while entering data. Addresses must be entered with the normal letter and number keys. The figures below show the keypad configurations for each version.

MLX checks for transposed characters. If you're supposed to type in A0 and instead enter 0A, MLX will catch your mistake. There is one error that can slip past MLX: Because of the checksum formula used, MLX won't notice if you accidentally type FF in place of 00, and vice versa. And there's a very slim chance that you could garble a line and still end up with a combination of characters that adds up to the proper checksum. However, these mistakes should not occur if you take reasonable care while entering data.

64 MLX Keypad



128 MLX Keypad



Editing Features

To correct typing mistakes before finishing a line, use the INST/DEL key to delete the character to the left of the cursor. (The cursor-left key also deletes.) If you mess up a line really badly, press CLR/HOME to start the line over. The RETURN key is also active, but only before any data is typed on a line. Pressing RETURN at this point returns you to the command menu. After you type a character of data, MLX disables RETURN until the cursor returns to the start of a line. Remember, you can press CLR/HOME to quickly get to a line

number prompt.

More editing features are available when correcting lines in which MLX has detected an error. To make corrections in a line that MLX has redisplayed for editing, compare the line on the screen with the one printed in the listing, then move the cursor to the mistake and type the correct key. The cursor left and right keys provide the normal cursor controls. (The INST/DEL key now works as an alternative cursor-left key.) You cannot move left beyond the first character in the line. If you try to move beyond the rightmost character, you'll reenter the line. During editing, RETURN is active; pressing it tells MLX to recheck the line. You can press the CLR/HOME key to clear the entire line if you want to start from scratch, or if you want to get to a line number prompt to use RETURN to get back to the menu.

Display Data

The second menu choice, DISPLAY DATA, examines memory and shows the contents in the same format as the program listing (including the checksum). When you press D, MLX asks you for a starting address. Be sure that the starting address you give corresponds to a line number in the listing. Otherwise, the checksum display will be meaningless. MLX displays program lines until it reaches the end of the program, at which point the menu is redisplayed. You can pause the display by pressing the space bar. (MLX finishes printing the current line before halting.) Press space again to restart the display. To break out of the display and get back to the menu before the ending address is reached, press RETURN.

Other Menu Options

Two more menu selections let you save programs and load them back into the computer. These are SAVE FILE and LOAD FILE; their operation is quite straightforward. When you press S or L, MLX asks you for the filename. You'll then be asked to press either D or T to select disk or tape.

You'll notice the disk drive starting and stopping several times during a load or save (save only for the 128 version). Don't panic; this is normal behavior. MLX opens and reads from or writes to the file instead of using the usual LOAD and SAVE commands (128 MLX makes use of BLOAD). Disk users should also note that the drive prefix 0: is automatically added to the filename (line 750 in 64 MLX), so this should *not* be included when entering the name. This also precludes the use of @ for Save-with-Replace, so remember to give each version you save a different name. The 128 version makes up for this by giving you the option of scratching the existing file if you want to reuse a filename.

Remember that MLX saves the entire workspace area from the starting address to the ending address, so the save or load may take longer than you might expect if you've entered only a small amount of data from a long listing. When saving a partially completed listing, make sure to note the address where you stopped typing so you'll know where to resume entry when you reload.

MLX reports the standard disk or tape error messages if any problems are detected during the save or load. (Tape users should bear in mind that Commodore computers are never able to detect errors during a save to tape.) MLX also has three special load error messages: INCORRECT STARTING ADDRESS, which means the file you're trying to load does not have the starting address you specified when you ran MLX; LOAD ENDED AT *address*, which means the file you're trying to load ends before the ending address you specified when you started MLX; and TRUNCATED AT ENDING ADDRESS, which means the file you're trying to load extends beyond the ending address you specified when you started MLX. If you see one of these messages and feel certain that you've loaded the right file, exit and rerun MLX, being careful to enter the correct starting and ending addresses.

The 128 version also has a CATALOG DISK option so you can view the contents of the disk directory before saving or loading.

The QUIT menu option has the obvious effect—it stops MLX and enters BASIC. The RUN/STOP key is disabled, so the Q option lets you exit the program without turning off the computer. (Of course, RUN/STOP–RESTORE also gets you out.) You'll be asked for verification; press Y to exit to BASIC, or any other key to return to the menu. After quitting, you can type RUN again and reenter MLX without losing your data, as long as you don't use the clear workspace option.

The Finished Product

When you've finished typing all the data for an ML program and saved your work, you're ready to see the results. The instructions for loading and using the finished product vary from program to program. Some ML programs are designed to be loaded and run like BASIC programs, so all you need to type is LOAD *"filename"*,8 for disk (DLOAD *"filename"* on the 128) or LOAD *"filename"* for tape, and then RUN. Such programs will usually have a starting address of 0801 for the 64 or 1C01 for the 128. Other programs must be reloaded to specific addresses with a command such as LOAD *"filename"*,8,1 for disk (BLOAD *"filename"* on the 128) or LOAD *"filename"*,1,1 for tape, then started with a SYS to a particular memory address. On the Commodore 64, the most common starting address for such programs is 49152, which corresponds to MLX address C000. In either case, you should always refer to the article which accompanies the ML listing for information on loading and running the program.

An Ounce Of Prevention

By the time you finish typing in the data for a long ML program, you may have several hours invested in the project. Don't take chances—use our "Automatic Proofreader" to type the new MLX, and then test your copy *thoroughly* before first using it to enter any significant amount of data. Make sure all the menu options work as they should. Enter fragments of the program starting at several different addresses, then use the Display option to verify that the data has been entered correctly. And be sure to test the Save and Load options several times to ensure that you can recall your work from disk or tape. Don't let a simple typing error in the new MLX cost you several nights of hard work.

Program 1: MLX For Commodore 64

```
SS 10 REM VERSION 1.1: LINES 8
      30,950 MODIFIED, LINES 4
      85-487 ADDED
EK 100 POKE 56,50:CLR:DIM IN$,
       I,J,A,B,A$,B$,A(7),N$
DM 110 C4=48:C6=16:C7=7:Z2=2:Z
       4=254:Z5=255:Z6=256:Z7=
       127
CJ 120 FA=PEEK(45)+Z6*PEEK(46)
       :BS=PEEK(55)+Z6*PEEK(56
       ):H$="0123456789ABCDEF"
SB 130 R$=CHR$(13):L$="{LEFT}"
       :S$=" ":D$=CHR$(20):Z$=
       CHR$(0):T$="{13 RIGHT}"
CQ 140 SD=54272:FOR I=SD TO SD
       +23:POKE I,0:NEXT:POKE
       {SPACE}SD+24,15:POKE 78
       8,52
FC 150 PRINT"{CLR}"CHR$(142)CH
       R$(8):POKE 53280,15:POK
       E 53281,15
EJ 160 PRINT T$" {RED}{RVS}
       {2 SPACES}{8 @}
       {2 SPACES}"SPC(28)"
       {2 SPACES}{OFF}{BLU} ML
       X II {RED}{RVS}
       {2 SPACES}"SPC(28)"
       {12 SPACES}{BLU}"
FR 170 PRINT"{3 DOWN}
       {3 SPACES}COMPUTE!'S MA
       CHINE LANGUAGE EDITOR
       {3 DOWN}"
JB 180 PRINT"{BLK}STARTING ADD
```

```
      RESS[4]";:GOSUB300:SA=A
      D:GOSUB1040:IF F THEN18
      0
GF 190 PRINT"{BLK}{2 SPACES}EN
      DING ADDRESS[4]";:GOSUB
      300:EA=AD:GOSUB1030:IF
      {SPACE}F THEN190
KR 200 INPUT"{3 DOWN}{BLK}CLEA
      R WORKSPACE [Y/N][4]";A
      $:IF LEFT$(A$,1)<>"Y"TH
      EN220
PG 210 PRINT"{2 DOWN}{BLU}WORK
      ING...";:FORI=BS TO BS+
      EA-SA+7:POKE I,0:NEXT:P
      RINT"DONE"
DR 220 PRINTTAB(10)"{2 DOWN}
      {BLK}{RVS} MLX COMMAND
      {SPACE}MENU {DOWN}[4]":
      PRINT T$"{RVS}E{OFF}NTE
      R DATA"
BD 230 PRINT T$"{RVS}D{OFF}ISP
      LAY DATA":PRINT T$"
      {RVS}L{OFF}OAD FILE"
JS 240 PRINT T$"{RVS}S{OFF}AVE
       FILE":PRINT T$"{RVS}Q
      {OFF}UIT{2 DOWN}{BLK}"
JH 250 GET A$:IF A$=N$ THEN250
HK 260 A=0:FOR I=1 TO 5:IF A$=
      MID$("EDLSQ",I,1)THEN A
      =I:I=5
FD 270 NEXT:ON A GOTO420,610,6
      90,700,280:GOSUB1060:GO
      TO250
EJ 280 PRINT"{RVS} QUIT ":INPU
      T"{DOWN}[4]ARE YOU SURE
       [Y/N]";A$:IF LEFT$(A$,
      1)<>"Y"THEN220
EM 290 POKE SD+24,0:END
JX 300 IN$=N$:AD=0:INPUTIN$:IF
      LEN(IN$)<>4THENRETURN
KF 310 B$=IN$:GOSUB320:AD=A:B$
      =MID$(IN$,3):GOSUB320:A
      D=AD*256+A:RETURN
PP 320 A=0:FOR J=1 TO 2:A$=MID
      $(B$,J,1):B=ASC(A$)-C4+
      (A$>"@")*C7:A=A*C6+B
JA 330 IF B<0 OR B>15 THEN AD=
      0:A=-1:J=2
GX 340 NEXT:RETURN
CH 350 B=INT(A/C6):PRINT MID$(
      H$,B+1,1);:B=A-B*C6:PRI
      NT MID$(H$,B+1,1);:RETU
      RN
RR 360 A=INT(AD/Z6):GOSUB350:A
      =AD-A*Z6:GOSUB350:PRINT
      ":";
BE 370 CK=INT(AD/Z6):CK=AD-Z4*
      CK+Z5*(CK>Z7):GOTO390
PX 380 CK=CK*Z2+Z5*(CK>Z7)+A
JC 390 CK=CK+Z5*(CK>Z5):RETURN
QS 400 PRINT"{DOWN}STARTING AT
      [4]";:GOSUB300:IF IN$<>
      N$ THEN GOSUB1030:IF F
      {SPACE}THEN400
EX 410 RETURN
HD 420 PRINT"{RVS} ENTER DATA
      {SPACE}":GOSUB400:IF IN
      $=N$ THEN220
JK 430 OPEN3,3:PRINT
SK 440 POKE198,0:GOSUB360:IF F
       THEN PRINT IN$:PRINT"
      {UP}{5 RIGHT}";
GC 450 FOR I=0 TO 24 STEP 3:B$
      =S$:FOR J=1 TO 2:IF F T
      HEN B$=MID$(IN$,I+J,1)
HA 460 PRINT"{RVS}"B$L$;:IF I<
      24THEN PRINT"{OFF}";
HD 470 GET A$:IF A$=N$ THEN470
FK 480 IF(A$>"/"ANDA$<":")OR(A
      $>"@"ANDA$<"G")THEN540
GS 485 A=-(A$="M")-2*(A$=",")-
      3*(A$=".")-4*(A$="/")-5
      *(A$="J")-6*(A$="K")
FX 486 A=A-7*(A$="L")-8*(A$=:
      ")-9*(A$="U")-10*(A$="I
      ")-11*(A$="O")-12*(A$="
      P")
CM 487 A=A-13*(A$=S$):IF A THE
      N A$=MID$("ABCD123E456F
      0",A,1):GOTO 540
MP 490 IF A$=R$ AND((I=0)AND(J
      =1)OR F)THEN PRINT B$;:
      J=2:NEXT:I=24:GOTO550
KC 500 IF A$="{HOME}" THEN PRI
      NT B$:J=2:NEXT:I=24:NEX
      T:F=0:GOTO440
MX 510 IF(A$="{RIGHT}")ANDF TH
      ENPRINT B$L$;:GOTO540
GK 520 IF A$<>L$ AND A$<>D$ OR
      ((I=0)AND(J=1))THEN GOS
      UB1060:GOTO470
HG 530 A$=L$+S$+L$:PRINT B$L$;
      :J=2-J:IF J THEN PRINT
      {SPACE}L$;:I=I-3
QS 540 PRINT A$;:NEXT J:PRINT
      {SPACE}S$;
PM 550 NEXT I:PRINT:PRINT"{UP}
      {5 RIGHT}";:INPUT#3,IN$
      :IF IN$=N$ THEN CLOSE3:
      GOTO220
QC 560 FOR I=1 TO 25 STEP3:B$=
      MID$(IN$,I):GOSUB320:IF
       I<25 THEN GOSUB380:A(I
      /3)=A
PK 570 NEXT:IF A<>CK THEN GOSU
      B1060:PRINT"{BLK}{RVS}
      {SPACE}ERROR: REENTER L
      INE [4]":F=1:GOTO440
HJ 580 GOSUB1080:B=BS+AD-SA:FO
      R I=0 TO 7:POKE B+I,A(I
      ):NEXT
QQ 590 AD=AD+8:IF AD>EA THEN C
      LOSE3:PRINT"{DOWN}{BLU}
      ** END OF ENTRY **{BLK}
      {2 DOWN}":GOTO700
GQ 600 F=0:GOTO440
QA 610 PRINT"{CLR}{DOWN}{RVS}
      {SPACE}DISPLAY DATA ":G
      OSUB400:IF IN$=N$ THEN2
      20
RJ 620 PRINT"{DOWN}{BLU}PRESS:
       {RVS}SPACE{OFF} TO PAU
      SE, {RVS}RETURN{OFF} TO
       BREAK[4]{DOWN}"
KS 630 GOSUB360:B=BS+AD-SA:FOR
      I=BTO B+7:A=PEEK(I):GOS
      UB350:GOSUB380:PRINT S$
      ;
CC 640 NEXT:PRINT"{RVS}";:A=CK
      :GOSUB350:PRINT
KH 650 F=1:AD=AD+8:IF AD>EA TH
      ENPRINT"{DOWN}{BLU}** E
      ND OF DATA **":GOTO220
KC 660 GET A$:IF A$=R$ THEN GO
      SUB1080:GOTO220
EQ 670 IF A$=S$ THEN F=F+1:GOS
      UB1080
AD 680 ONFGOTO630,660,630
CM 690 PRINT"{DOWN}{RVS} LOAD
      {SPACE}DATA ":OP=1:GOTO
      710
PC 700 PRINT"{DOWN}{RVS} SAVE
      {SPACE}FILE ":OP=0
RX 710 IN$=N$:INPUT"{DOWN}FILE
      NAME[4]";IN$:IF IN$=N$
      {SPACE}THEN220
PR 720 F=0:PRINT"{DOWN}{BLK}
      {RVS}T{OFF}APE OR {RVS}
      D{OFF}ISK: [4]";
FP 730 GET A$:IF A$="T"THEN PR
      INT"T{DOWN}":GOTO880
HQ 740 IF A$<>"D"THEN730
HH 750 PRINT"D{DOWN}":OPEN15,8
      ,15,"I0:":B=EA-SA:IN$="
      0:"+IN$:IF OP THEN810
SQ 760 OPEN 1,8,8,IN$+",P,W":G
      OSUB860:IF A THEN220
FJ 770 AH=INT(SA/256):AL=SA-(A
      H*256):PRINT#1,CHR$(AL)
      ;CHR$(AH);
PE 780 FOR I=0 TO B:PRINT#1,CH
      R$(PEEK(BS+I));:IF ST T
      HEN800
FC 790 NEXT:CLOSE1:CLOSE15:GOT
      O940
GS 800 GOSUB1060:PRINT"{DOWN}
      {BLK}ERROR DURING SAVE:
      [4]":GOSUB860:GOTO220
MA 810 OPEN 1,8,8,IN$+",P,R":G
      OSUB860:IF A THEN220
GE 820 GET#1,A$,B$:AD=ASC(A$+Z
      $)+256*ASC(B$+Z$):IF AD
      <>SA THEN F=1:GOTO850
RX 830 FOR I=0 TO B:GET#1,A$:P
      OKE BS+I,ASC(A$+Z$):IF(
      I<>B)AND ST THEN F=2:AD
      =I:I=B
FA 840 NEXT:IF ST<>64 THEN F=3
FQ 850 CLOSE1:CLOSE15:ON ABS(F
      >0)+1 GOTO960,970
SA 860 INPUT#15,A,A$:IF A THEN
       CLOSE1:CLOSE15:GOSUB10
      60:PRINT"{RVS}ERROR: "A
      $
GQ 870 RETURN
EJ 880 POKE183,PEEK(FA+2):POKE
      187,PEEK(FA+3):POKE188,
      PEEK(FA+4):IFOP=0THEN92
      0
HJ 890 SYS 63466:IF(PEEK(783)A
      ND1)THEN GOSUB1060:PRIN
      T"{DOWN}{RVS} FILE NOT
      {SPACE}FOUND ":GOTO690
CS 900 AD=PEEK(829)+256*PEEK(8
      30):IF AD<>SA THEN F=1:
      GOTO970
SC 910 A=PEEK(831)+256*PEEK(83
      2)-1:F=F-2*(A<EA)-3*(A>
      EA):AD=A-AD:GOTO930
KM 920 A=SA:B=EA+1:GOSUB1010:P
      OKE780,3:SYS 63338
JF 930 A=BS:B=BS+(EA-SA)+1:GOS
      UB1010:ON OP GOTO950:SY
      S 63591
AE 940 GOSUB1080:PRINT"{BLU}**
       SAVE COMPLETED **":GOT
      O220
XP 950 POKE147,0:SYS 63562:IF
      {SPACE}ST>0 THEN970
FR 960 GOSUB1080:PRINT"{BLU}**
       LOAD COMPLETED **":GOT
      O220
DP 970 GOSUB1060:PRINT"{BLK}
      {RVS}ERROR DURING LOAD:
      {DOWN}[4]":ON F GOSUB98
      0,990,1000:GOTO220
PP 980 PRINT"INCORRECT STARTIN
      G ADDRESS (";:GOSUB360:
      PRINT")":RETURN
GR 990 PRINT"LOAD ENDED AT ";:
      AD=SA+AD:GOSUB360:PRINT
       D$:RETURN
FD 1000 PRINT"TRUNCATED AT END
      ING ADDRESS":RETURN
RX 1010 AH=INT(A/256):AL=A-(AH
      *256):POKE193,AL:POKE1
      94,AH
FF 1020 AH=INT(B/256):AL=B-(AH
      *256):POKE174,AL:POKE1
      75,AH:RETURN
FX 1030 IF AD<SA OR AD>EA THEN
       1050
HA 1040 IF(AD>511 AND AD<40960
```

```
        )OR(AD>49151 AND AD<53
        248)THEN GOSUB1080:F=0
        :RETURN
HC 1050 GOSUB1060:PRINT"{RVS}
        {SPACE}INVALID ADDRESS
         {DOWN}{BLK}":F=1:RETU
        RN
AR 1060 POKE SD+5,31:POKE SD+6
        ,208:POKE SD,240:POKE
        {SPACE}SD+1,4:POKE SD+
        4,33
DX 1070 FOR S=1 TO 100:NEXT:GO
        TO1090
PF 1080 POKE SD+5,8:POKE SD+6,
        240:POKE SD,0:POKE SD+
        1,90:POKE SD+4,17
AC 1090 FOR S=1 TO 100:NEXT:PO
        KE SD+4,0:POKE SD,0:PO
        KE SD+1,0:RETURN
```

Program 2: MLX For Commodore 128

```
AE 100 TRAP 960:POKE 4627,128:
       DIM NL$,A(7)
XP 110 Z2=2:Z4=254:Z5=255:Z6=2
       56:Z7=127:BS=256*PEEK(4
       627):EA=65280
FB 120 BE$=CHR$(7):RT$=CHR$(13
       ):DL$=CHR$(20):SP$=CHR$
       (32):LF$=CHR$(157)
KE 130 DEF FNHB(A)=INT(A/256):
       DEF FNLB(A)=A-FNHB(A)*2
       56:DEF FNAD(A)=PEEK(A)+
       256*PEEK(A+1)
JB 140 KEY 1,"A":KEY 3,"B":KEY
        5,"C":KEY 7,"D":VOL 15
       :IF RGR(0)=5 THEN FAST
FJ 150 PRINT"{CLR}"CHR$(142);C
       HR$(8):COLOR 0,15:COLOR
        4,15:COLOR 6,15
GQ 160 PRINT TAB(12)"{RED}
       {RVS}{2 SPACES}[9 @3
       {2 SPACES}"RT$;TAB(12)"
       {RVS}{2 SPACES}{OFF}
       {BLU} 128 MLX {RED}
       {RVS}{2 SPACES}"RT$;TAB
       (12)"{RVS}{13 SPACES}
       {BLU}"
FE 170 PRINT"{2 DOWN}
       {3 SPACES}COMPUTE!'S MA
       CHINE LANGUAGE EDITOR
       {2 DOWN}"
DK 180 PRINT"{BLK}STARTING ADD
       RESS[43";:GOSUB 260:IF
       {SPACE}AD THEN SA=AD:EL
       SE 180
FH 190 PRINT"{BLK}{2 SPACES}EN
       DING ADDRESS[43";:GOSUB
        260:IF AD THEN EA=AD:E
       LSE 190
MF 200 PRINT"{DOWN}{BLK}CLEAR
       {SPACE}WORKSPACE [Y/N]?
       [43":GETKEY A$:IF A$<>"
       Y" THEN 220
QH 210 PRINT"{DOWN}{BLU}WORKIN
       G...";:BANK 0:FOR A=BS
       {SPACE}TO BS+(EA-SA)+7:
       POKE A,0:NEXT A:PRINT"D
       ONE"
DC 220 PRINT TAB(10)"{DOWN}
       {BLK}{RVS} MLX COMMAND
       {SPACE}MENU [43{DOWN}":
       PRINT TAB(13)"{RVS}E
       {OFF}NTER DATA"RT$;TAB(
       13)"{RVS}D{OFF}ISPLAY D
       ATA"RT$;TAB(13)"{RVS}L
       {OFF}OAD FILE"
HB 230 PRINT TAB(13)"{RVS}S
       {OFF}AVE FILE"RT$;TAB(1
       3)"{RVS}C{OFF}ATALOG DI
       SK"RT$;TAB(13)"{RVS}Q
       {OFF}UIT{DOWN}{BLK}"
AP 240 GETKEY A$:A=INSTR("EDLS
       CQ",A$):ON A GOTO 340,5
       50,640,650,930,940:GOSU
       B 950:GOTO 240
SX 250 PRINT"STARTING AT";:GOS
       UB 260:IF(AD<>0)OR(A$=N
       L$)THEN RETURN:ELSE 250
BG 260 A$=NL$:INPUT A$:IF LEN(
       A$)=4 THEN AD=DEC(A$)
PP 270 IF AD=0 THEN BEGIN:IF A
       $<>NL$ THEN 300:ELSE RE
       TURN:BEND
MA 280 IF AD<SA OR AD>EA THEN
       {SPACE}300
PM 290 IF AD>511 AND AD<65280
       {SPACE}THEN PRINT BE$;:
       RETURN
SQ 300 GOSUB 950:PRINT"{RVS} I
       NVALID ADDRESS {DOWN}
       {BLK}":AD=0:RETURN
RD 310 CK=FNHB(AD):CK=AD-Z4*CK
       +Z5*(CK>Z7):GOTO 330
DD 320 CK=CK*Z2+Z5*(CK>Z7)+A
AH 330 CK=CK+Z5*(CK>Z5):RETURN
QD 340 PRINT BE$;"{RVS} ENTER
       {SPACE}DATA ":GOSUB 250
       :IF A$=NL$ THEN 220
JA 350 BANK 0:PRINT:F=0:OPEN 3
       ,3
BR 360 GOSUB 310:PRINT HEX$(AD
       )+":";:IF F THEN PRINT
       {SPACE}L$:PRINT"{UP}
       {5 RIGHT}";
QA 370 FOR I=0 TO 24 STEP 3:B$
       =SP$:FOR J=1 TO 2:IF F
       {SPACE}THEN B$=MID$(L$,
       I+J,1)
PS 380 PRINT"{RVS}"B$+LF$;:IF
       {SPACE}I<24 THEN PRINT"
       {OFF}";
RC 390 GETKEY A$:IF (A$>"/" AN
       D A$<":") OR(A$>"@" AND
        A$<"G") THEN 470
AC 400 IF A$="+" THEN A$="E":G
       OTO 470
QB 410 IF A$="-" THEN A$="F":G
       OTO 470
FB 420 IF A$=RT$ AND ((I=0) AN
       D (J=1) OR F) THEN PRIN
       T B$;:J=2:NEXT:I=24:GOT
       O 480
RD 430 IF A$="{HOME}" THEN PRI
       NT B$:J=2:NEXT:I=24:NEX
       T:F=0:GOTO 360
XB 440 IF (A$="{RIGHT}") AND F
        THEN PRINT B$+LF$;:GOT
       O 470
JP 450 IF A$<>LF$ AND A$<>DL$
       {SPACE}OR ((I=0) AND (J
       =1)) THEN GOSUB 950:GOT
       O 390
PS 460 A$=LF$+SP$+LF$:PRINT B$
       +LF$;:J=2-J:IF J THEN P
       RINT LF$;:I=I-3
GB 470 PRINT A$;:NEXT J:PRINT
       {SPACE}SP$;
HA 480 NEXT I:PRINT:PRINT"{UP}
       {5 RIGHT}";:L$="
       {27 SPACES}"
DP 490 FOR I=1 TO 25 STEP 3:GE
       T#3,A$,B$:IF A$=SP$ THE
       N I=25:NEXT:CLOSE 3:GOT
       O 220
BA 500 A$=A$+B$:A=DEC(A$):MID$
       (L$,I,2)=A$:IF I<25 THE
       N GOSUB 320:A(I/3)=A:GE
       T#3,A$
AR 510 NEXT I:IF A<>CK THEN GO
       SUB 950:PRINT:PRINT"
       {RVS} ERROR: REENTER LI
       NE ":F=1:GOTO 360
DX 520 PRINT BE$:B=BS+AD-SA:FO
       R I=0 TO 7:POKE B+I,A(I
       ):NEXT I
XB 530 F=0:AD=AD+8:IF AD<=EA T
       HEN 360
CA 540 CLOSE 3:PRINT"{DOWN}
       {BLU}** END OF ENTRY **
       {BLK}{2 DOWN}":GOTO 650
MC 550 PRINT BE$;"{CLR}{DOWN}
       {RVS} DISPLAY DATA ":GO
       SUB 250:IF A$=NL$ THEN
       {SPACE}220
JF 560 BANK 0:PRINT"{DOWN}
       {BLU}PRESS: {RVS}SPACE
       {OFF} TO PAUSE, {RVS}RE
       TURN{OFF} TO BREAK[43
       {DOWN}"
XA 570 PRINT HEX$(AD)+":";:GOS
       UB 310:B=BS+AD-SA
DJ 580 FOR I=B TO B+7:A=PEEK(I
       ):PRINT RIGHT$(HEX$(A),
       2);SP$;:GOSUB 320:NEXT
       {SPACE}I
XB 590 PRINT"{RVS}";RIGHT$(HEX
       $(CK),2)
GR 600 F=1:AD=AD+8:IF AD>EA TH
       EN PRINT"{BLU}** END OF
        DATA **":GOTO 220
EB 610 GET A$:IF A$=RT$ THEN P
       RINT BE$:GOTO 220
QK 620 IF A$=SP$ THEN F=F+1:PR
       INT BE$;
XS 630 ON F GOTO 570,610,570
RF 640 PRINT BE$"{DOWN}{RVS} L
       OAD DATA ":OP=1:GOTO 66
       0
BP 650 PRINT BE$"{DOWN}{RVS} S
       AVE FILE ":OP=0
DM 660 F=0:F$=NL$:INPUT"FILENA
       ME[43";F$:IF F$=NL$ THE
       N 220
RF 670 PRINT"{DOWN}{BLK}{RVS}T
       {OFF}APE OR {RVS}D{OFF}
       ISK: [43";
SQ 680 GETKEY A$:IF A$="T" THE
       N 850:ELSE IF A$<>"D" T
       HEN 680
SP 690 PRINT"DISK{DOWN}":IF OP
        THEN 760
EG 700 DOPEN#1,(F$+",P"),W:IF
       {SPACE}DS THEN A$=DS$:G
       OTO 740
JH 710 BANK 0:POKE BS-2,FNLB(S
       A):POKE BS-1,FNHB(SA):P
       RINT"SAVING ";F$:PRINT
MC 720 FOR A=BS-2 TO BS+EA-SA:
       PRINT#1,CHR$(PEEK(A));:
       IF ST THEN A$="DISK WRI
       TE ERROR":GOTO 750
GC 730 NEXT A:CLOSE 1:PRINT"
       {BLU}** SAVE COMPLETED
       {SPACE}WITHOUT ERRORS *
       *":GOTO 220
RA 740 IF DS=63 THEN BEGIN:CLO
       SE 1:INPUT"{BLK}REPLACE
        EXISTING FILE [Y/N][43
       ";A$:IF A$="Y" THEN SCR
       ATCH(F$):PRINT:GOTO 700
       :ELSE PRINT"{BLK}":GOTO
        660:BEND
GA 750 CLOSE 1:GOSUB 950:PRINT
       "{BLK}{RVS} ERROR DURIN
       G SAVE: [43":PRINT A$:G
       OTO 220
FD 760 DOPEN#1,(F$+",P"):IF DS
        THEN A$=DS$:F=4:CLOSE
       {SPACE}1:GOTO 790
```

```
PX 770 GET#1,A$,B$:CLOSE 1:AD=
       ASC(A$)+256*ASC(B$):IF
       {SPACE}AD<>SA THEN F=1:
       GOTO 790
KB 780 PRINT"LOADING ";F$:PRIN
       T:BLOAD(F$),B0,P(BS):AD
       =SA+FNAD(174)-BS-1:F=-2
       *(AD<EA)-3*(AD>EA)
RQ 790 IF F THEN 800:ELSE PRIN
       T"{BLU}** LOAD COMPLETE
       D WITHOUT ERRORS **":GO
       TO 220
ER 800 GOSUB 950:PRINT"{BLK}
       {RVS} ERROR DURING LOAD
       : [4]":ON F GOSUB 810,8
       20,830,840:GOTO220
QJ 810 PRINT"INCORRECT STARTIN
       G ADDRESS (";HEX$(AD);"
       )":RETURN
DP 820 PRINT"LOAD ENDED AT ";H
       EX$(AD):RETURN
EB 830 PRINT"TRUNCATED AT ENDI
       NG ADDRESS ("HEX$(EA)")
       ":RETURN
FP 840 PRINT"DISK ERROR ";A$:R
       ETURN
KS 850 PRINT"TAPE":AD=POINTER(
       F$):BANK 1:A=PEEK(AD):A
       L=PEEK(AD+1):AH=PEEK(AD
       +2)
XX 860 BANK 15:SYS DEC("FF68")
       ,0,1:SYS DEC("FFBA"),1,
       1,0:SYS DEC("FFBD"),A,A
       L,AH:SYS DEC("FF90"),12
       8:IF OP THEN 890
FG 870 PRINT:A=SA:B=EA+1:GOSUB
        920:SYS DEC("E919"),3:
       PRINT"SAVING ";F$
AB 880 A=BS:B=BS+(EA-SA)+1:GOS
       UB 920:SYS DEC("EA18"):
       PRINT"{DOWN}{BLU}** TAP
       E SAVE COMPLETED **":GO
       TO 220
CP 890 SYS DEC("E99A"):PRINT:I
       F PEEK(2816)=5 THEN GOS
       UB 950:PRINT"{DOWN}
       {BLK}{RVS} FILE NOT FOU
       ND ":GOTO 220
GQ 900 PRINT"LOADING ...{DOWN}
       ":AD=FNAD(2817):IF AD<>
       SA THEN F=1:GOTO 800:EL
       SE AD=FNAD(2819)-1:F=-2
       *(AD<EA)-3*(AD>EA)
JD 910 A=BS:B=BS+(EA-SA)+1:GOS
       UB 920:SYS DEC("E9FB"):
       IF ST>0 THEN 800:ELSE 7
       90
XB 920 POKE193,FNLB(A):POKE194
       ,FNHB(A):POKE 174,FNLB(
       B):POKE 175,FNHB(B):RET
       URN
CP 930 CATALOG:PRINT"{DOWN}
       {BLU}** PRESS ANY KEY F
       OR MENU **":GETKEY A$:G
       OTO 220
MM 940 PRINT BE$"{RVS} QUIT
       [4]";RT$;"ARE YOU SURE
       {SPACE}[Y/N]?":GETKEY A
       $:IF A$<>"Y" THEN 220:E
       LSE PRINT"{CLR}":BANK 1
       5:END
JE 950 SOUND 1,500,10:RETURN
AF 960 IF ER=14 AND EL=260 THE
       N RESUME 300
MK 970 IF ER=14 AND EL=500 THE
       N RESUME NEXT
KJ 980 IF ER=4 AND EL=780 THEN
        F=4:A$=DS$:RESUME 800
DQ 990 IF ER=30 THEN RESUME:EL
       SE PRINT ERR$(ER);" ERR
       OR IN LINE";EL
```

Moon Rescue

Article on page 50.

```
AJ 10 GRAPHIC 1,1
FJ 20 COLOR4,12:COLOR0,1:COLOR
      1,2:GRAPHIC0,1:FORI=1TO4
      :MOVSPR I,0,0:NEXT
HS 30 CHAR1,14,8,"MOON RESCUE"
      :CHAR1,10,15,"MAKE NEW R
      OCKS (Y/N)"
FR 40 GETKEY A$:GRAPHIC1:FAST
AX 50 WIDTH2:DRAW 1,100,99TO10
      0,104:DRAW1,220,99TO220,
      104:WIDTH1:DRAW1,100,104
      TO100,107TO102,107TO102,
      104,104,102TO105,103,103
      ,101TO98,101,97,100TO97,
      99
JM 60 DRAW1,219,104TO219,107,2
      21,107TO221,104,224,101T
      O225,99,223,101TO218,101
      ,217,102TO216,103
EM 70 CIRCLE1,21,21,10,8:BOX1,
      14,26,28,29,0,1:PAINT1,2
      1,21
ME 80 DRAW1,15,30TO15,31,13,32
      TO17,32,27,28TO27,31,25,
      32TO29,32
CG 90 BOX0,11,10,14,16,0,1:BOX
      0,28,10,33,16,0,1:BOX0,1
      8,15,24,21:BOX0,18,24,20
      ,26:BOX0,24,24,22,26
JA 100 DRAW0,15,17TO15,26,27,1
      7TO27,26:WIDTH2:DRAW0,1
      8,28TO17,29,23,28TO24,2
      9
SA 110 DRAW0,12,21TO12,22,29,2
      1TO29,22:WIDTH1
CP 120 SSHAPEM1$,97,99,106,107
      :SSHAPEM2$,216,99,226,1
      07:SSHAPEE$,70,70,79,78
XK 130 SSHAPE LP$,9,12,32,32
HP 140 SSHAPEC$(1),9,10,22,32:
      SSHAPEC$(2),10,9,32,22
JR 150 GSHAPEE$,97,99:GSHAPEE$
      ,216,99:BOX0,9,12,32,32
      ,0,1
GE 160 IF A$<>"Y"THEN260
CG 170 FORW=1TO25:I=(INT(76*RN
      D(W))+45):X=INT(19*RND(
      W)+1)/2:Y=INT(20*RND(W)
      +1)/2:A=INT(360*RND(W)+
      1)
AB 180 CIRCLE1,100,100,X,Y,(36
      0-A),W,I:NEXTW:SSHAPEA$
      ,88,90,111,110
RE 190 FORS=1TO4:SPRSAVA$,S:SP
      RITES,1,9,0,0,0,1:SPRCO
      LOR1,11:NEXTS
CE 200 BOX0,88,90,111,110,0,1
BH 210 SCNCLR
SM 220 FORW=1TO15:X=INT(320*RN
      D(1))+1:Y=INT(75*RND(1)
      )+45:DRAW1,X,Y:NEXTW
EC 230 COLOR1,8:CIRCLE1,300,20
      ,15,15:PAINT1,300,20:BO
      X1,155,0,165,6,0,1:COLO
      R1,2:DRAW1,150,9TO160,1
      TO170,9
EX 240 COLOR1,6:DRAW1,0,150TO4
      0,150,40,150TO105,175,1
      05,175TO215,175,215,175
      TO280,150,280,150TO320,
      150:WIDTH2:PAINT1,1,151
      :WIDTH1
XG 250 PAINT 1,1,151:DRAW0,30,
      200TO105,175:DRAW0,215,
      175TO290,200
XD 260 COLOR1,2:CHAR1,15,24,"M
      OON RESCUE":SLOW
SR 270 CHAR1,0,0,"SAVED: 0
      {2 SPACES}LOST: 0[D]",1
CD 280 CHAR1,22,0,"[F]SET:0
      {3 SPACES}PROBE:0
      {2 SPACES}",1
PC 290 ML=4:MK=0:MS=0:P=3:L=1:
      S=0
XQ 300 FORS=1TO4:GOSUB740:MOVS
      PRS,100,((S*21)+68):NEX
      TS
HD 310 RESTORE:FORM=1TO4:READX
      H(M),YH(M):NEXTM
DE 320 FORW=1TO4:M$(W,1)=M1$:M
      $(W,2)=M2$:NEXTW:GOSUB4
      50:GOSUB480
HC 330 B=0:D=0:SP=0:J=0:MO=0:S
      PRSAV LP$,8
DG 340 MOVSPR8,173,58:SPRITE8,
      1,4,0,0,0,0
ER 350 IFML<1ANDMO=0ANDP>0THEN
      ML=4:L=L+1:GOSUB440:P=P
      +1:GOTO320
GE 360 GOSUB440:GOTO410
PG 370 IFSP<>1THEN410
HH 380 X=RSPPOS(8,0):IFX<24ORX
      >318THEN660
BR 390 Y=RSPPOS(8,1):IFY<66ORY
      >172THEN500
MB 400 B=BUMP(1):IFB>128ANDB<1
      44THEN660
EJ 410 J=JOY(2):IFJ=0THENJ=D:E
      LSEGOSUB720:IFJ=1ORJ=5T
      HEND=J:SP=1
PA 420 MOVSPR8,((J-1)*45)#SP:F
      ORW=1TO4:GSHAPEM$(W,M),
      XH(W),YH(W):NEXTW:M=M+1
      :GOSUB750:IFM>2THENM=1
JA 430 GOTO370
SM 440 CHAR1,6,0,STR$(MS),1:CH
      AR1,15,0,STR$(MK),1:CHA
      R1,27,0,STR$(L),1:CHAR1
      ,37,0,STR$(P),1:RETURN
RK 450 FORS=1TO4:D=90:SP=INT(4
      *RND(1))+1
KK 460 IFINT(S/2)=S/2THEND=270
DF 470 MOVSPRS,D#SP:NEXTS:RETU
      RN
KC 480 B=BUMP(1):IFB>0THEN480
FF 490 RETURN
KA 500 MOVSPR8,0#0:B=BUMP(1):I
      FB>128ANDB<144THEN660
BG 510 IFY>172THEN560
QM 520 IFD=5THENMOVSPR8,0#1:GO
      TO410
RD 530 IFX<160ORX>180THEN660
JS 540 GOSUB730:MOVSPR8,173,58
      :SP=0:D=0:IFMO=1THENMS=
      MS+1:MO=0:GOSUB480:GOSU
      B740
RH 550 GOTO350
BG 560 IF X<53THEN A=1:GOTO620
MH 570 IF X>302THENA=4:GOTO620
MK 580 IF Y<200THENMOVSPR8,0#1
      :GOTO410
GX 590 IF X>129ANDX<155THENA=2
      :GOTO630
GK 600 IF X>181ANDX<213THENA=3
      :GOTO630
HQ 610 GOTO660
MC 620 MOVSPR8,X,178:GOTO640
PA 630 MOVSPR8,X,202
CE 640 IFM$(A,1)<>E$ANDMO=0THE
      NM$(A,1)=E$:M$(A,2)=E$:
      MO=1:ML=ML-1:GOSUB740
RK 650 SLEEP1:GOSUB450:SP=0:D=
      0:GOTO350
KF 660 GOSUB760:P=P-1:MOVSPR8,
      0#0:SPRITE8,1,4,0,0,1,0
      :IFMO=1THENMK=MK+1:MO=0
```

```
SK 670 IFML<1ANDMO=0ANDP>0THEN
       ML=4:L=L+1:GOSUB440:P=P
       +1:GOTO320
SS 680 GOSUB440:FORW=1TO4:SPRS
       AVC$(W),8:NEXTW:SPRITE8
       ,0:GOSUB480
GK 690 IFP>0THENGOSUB440:GOTO3
       30
RX 700 FORS=1TO4:MOVSPRS,0#0:N
       EXTS:SLEEP3:RUN20
CM 710 DATA 20,140,125,165,180
       ,165,300,140
QM 720 SOUND2,54630,(S+5),1,27
       8,0,3,3119:RETURN
HX 730 SOUND1,6330,2,1,22376,1
       6585,1,756:RETURN
MQ 740 SOUND3,25911,2,1,3043,3
       640,0,3194:RETURN
SQ 750 SOUND1,885,(DU+2),1,120
       48,8021,3,1427:DU=0:RET
       URN
KR 760 DU=18:SOUND3,12000,10,2
       ,400,900,3:GOSUB750:RET
       URN
```

Sprite Locater

Article on page 72.

```
PM 100 POKE 53280,6:POKE 53281
       ,6:PRINT"{CLR}{WHT}
       {3 SPACES}READING DATA
SC 110 FOR I=832 TO 895:READ A
       :POKE I,A:NEXT
RM 120 FOR I=49152 TO 49486:RE
       AD A:POKE I,A:X=X+A:NEX
       T
PE 130 IF X<>41606 THEN PRINT"
       {CLR}{WHT}ERROR IN DATA
        STATEMENTS.":STOP
MR 140 SYS 49152
HM 150 REM{2 SPACES}SPRITE CRO
       SSHAIR DATA
JF 160 DATA 255,255,255,128,8,
       1,128,8,1,128,8,1,128,8
       ,1,128
DH 170 DATA 8,1,128,8,1,128,8,
       1,128,8,1,128,8,1,255,2
       55,255,128,8,1
RA 180 DATA 128,8,1,128,8,1,12
       8,8,1,128,8,1,128,8,1,1
       28,8,1,128,8
CG 190 DATA 1,128,8,1,255,255,
       255,0
PD 200 REM{2 SPACES}MAIN ROUTI
       NE DATA
QD 210 DATA 32,17,193,169,1,13
       3,255,32,44,193
SR 220 DATA 32,29,192,32,154,1
       92,32,228,255,240
JP 230 DATA 242,169,0,160,21,1
       53,0,208,96,173
XR 240 DATA 0,220,74,176,3,206
       ,1,208,74,176
EX 250 DATA 3,238,1,208,74,176
       ,38,173,0,208
QB 260 DATA 208,29,173,16,208,
       41,1,208,14,173
AA 270 DATA 16,208,9,1,141,16,
       208,169,80,141
AJ 280 DATA 0,208,96,173,16,20
       8,41,254,141,16
PM 290 DATA 208,206,0,208,96,7
       4,176,33,238,0
AF 300 DATA 208,240,52,169,80,
       205,0,208,208,53
JM 310 DATA 173,16,208,41,1,24
       0,46,173,16,208
PP 320 DATA 41,254,141,16,208,
       169,0,141,0,208
BJ 330 DATA 96,74,176,29,162,1
       12,160,255,32,48
AX 340 DATA 193,165,255,24,105
       ,1,201,16,48,2
SE 350 DATA 169,1,133,255,96,1
       73,16,208,9,1
AK 360 DATA 141,16,208,96,160,
       0,185,55,193,32
HG 370 DATA 210,255,200,192,3,
       208,245,173,0,208
RP 380 DATA 32,203,192,185,55,
       193,32,210,255,200
AK 390 DATA 192,6,208,245,173,
       1,208,32,203,192
EF 400 DATA 185,55,193,32,210,
       255,200,192,11,208
DD 410 DATA 245,165,255,141,66
       ,193,162,255,56,141
AM 420 DATA 66,193,233,100,232
       ,176,248,138,201,0
KB 430 DATA 208,6,32,12,193,76
       ,231,192,32,6
PC 440 DATA 193,173,66,193,162
       ,255,56,141,66,193
GF 450 DATA 233,10,232,176,248
       ,138,201,0,208,6
HA 460 DATA 32,12,193,76,3,193
       ,32,6,193,173
HK 470 DATA 66,193,24,105,48,7
       6,210,255,169,48
QC 480 DATA 76,210,255,160,0,1
       85,67,193,201,255
KR 490 DATA 240,12,170,200,185
       ,67,193,157,0,208
SS 500 DATA 200,76,19,193,169,
       13,141,248,7,96
HQ 510 DATA 166,255,160,0,136,
       208,253,202,208,250
BJ 520 DATA 96,19,88,61,32,89,
       61,32,83,80,68,61,0,0
QP 530 DATA 120,1,120,16,0,21,
       1,39,1,255,255,0,255,0,
       255,0
```

Sprite Graph

Article on page 84.

```
SJ 10 PRINT"{CLR}{WHT}
      {14 SPACES}SPRITE GRAPH
      {2 DOWN}"
EJ 20 INPUT"HOW MANY GRAPHS";B
      :F=1:IF B<1 THEN END
JS 30 OPEN3,4:PRINT#3,CHR$(14)
      "{2 SPACES}SPRITE GRAPH"
      :A=1:REM CHR$(14)-DOUBLE
       WIDTH MODE
CS 40 FORI=1TO24:PRINT#3:PRINT
      #3
EJ 50 PRINT#3,CHR$(15)"
      {5 SPACES}1{7 SPACES}1
      {7 SPACES}1":REM CHR$(15
      )-STANDARD CHAR MODE
FC 60 PRINT#3,CHR$(15)"
      {5 SPACES}2631{4 SPACES}
      2631{4 SPACES}2631"
FK 70 PRINT#3,CHR$(15)"
      {5 SPACES}84268421842684
      2184268421"CHR$(8):REM C
      HR$(8)-BIT IMAGE
XS 80 PRINT#3,CHR$(15)"
      {4 SPACES}[A][23 R][S]"C
      HR$(8)
SF 90 PRINT#3,CHR$(15)A;"[Q]+
      ++++++++++++++++++++++
      [W]"CHR$(8):A=A+1
SG 100 IF A>9 THEN 120
MR 110 GOTO 90
SJ 120 PRINT#3,CHR$(15)A;"[Q]+
       ++++++++++++++++++++++
       [W]"CHR$(8):A=A+1
BC 130 IF A=21 THEN 150
MM 140 GOTO 120
HM 150 PRINT#3,CHR$(15)" 21
       [Z][23 E][X]"CHR$(8)
AF 160 PRINT#3:PRINT F:F=F+1
RG 170 IF F<B+1 THEN A=1:GOTO
       {SPACE}40
SQ 180 CLOSE3:END
```

Pegs

Article on page 52.

Program 1: Pegs—64 Version

```
DR 10 DIMP(15),O(8),C(8),TC(14
      ,15),M$(36)
AR 20 BL$="":FORI=1TO39:BL$=BL
      $+" ":NEXT:DC=54272:C=64
      :P=49152:B=0:SP=32
CH 30 FORI=1TO15:READP(I):NEXT
BD 40 FORI=1TO8:READC(I):NEXT:
      FORI=1TO8:READO(I):NEXT
XR 50 FORI=1TO18:READM$(I)
KF 60 M$(I+18)=RIGHT$(M$(I),1)
      +MID$(M$(I),2,1)+LEFT$(M
      $(I),1):NEXT
XJ 70 FORI=PTOP+22:READD:POKEI
      ,D:NEXT
FK 80 PRINT"{CLR}{BLK}";:POKE5
      3280,6:POKE53281,15
RR 90 PRINT"{RVS}{BLU}
      {18 SPACES}PEGS
      {18 SPACES}{OFF}";
GH 100 SYSP,2,1:PRINT"{BLK}SCO
       RE:";S:FORI=1TO15:POKEP
       (I),I:POKEP(I)+DC,2
PQ 110 NEXT:FORI=2TO15:FORJ=1T
       O8:POKEP(I)+O(J),C(J):P
       OKEP(I)+O(J)+DC,B:NEXT:
       NEXT
PP 120 FORI=1TO8:POKEP(1)+O(I)
       +DC,B:POKEP(1)+O(I),SP:
       NEXT
HA 130 T=1:FORI=2TO15:TC(T,I)=
       1:NEXT:TC(T,1)=0:S=0
MP 140 SYSP,23,0:PRINTBL$:SYSP
       ,23,14:PRINT"YOUR MOVE"
       ;
BG 150 INPUTA$:IFT>1ANDA$="<"T
       HEN340
EQ 160 IFLEN(A$)<>2THEN310
XE 170 BM=1:FORI=1TO36:IFA$=LE
       FT$(M$(I),1)+RIGHT$(M$(
       I),1)THENBM=0:MC=I:I=36
MA 180 NEXT:IFBM>0THEN310
QM 190 MF=ASC(LEFT$(A$,1))-C:J
       P=ASC(MID$(M$(MC),2,1))
       -C:MT=ASC(RIGHT$(A$,1))
       -C
CH 200 IFTC(T,MF)=0ORTC(T,MT)=
       1ORTC(T,JP)=0THEN310
RB 210 FORI=1TO8:POKEP(MF)+O(I
       ),SP:POKEP(MT)+O(I),C(I
       ):NEXT
BA 220 FORI=1TO8:POKEP(JP)+O(I
       ),SP:NEXT:GOSUB460
GC 230 T=T+1:FORI=1TO15:TC(T,I
       )=TC(T-1,I):NEXT
FQ 240 TC(T,MF)=0:TC(T,MT)=1:T
       C(T,JP)=0:S=S+1
HH 250 SYSP,2,1:PRINT"SCORE:";
       S;"{LEFT} ":IFS=13THENG
       OTO440
FH 260 LC=0:FORI=1TO36:X=TC(T,
       ASC(LEFT$(M$(I),1))-C)
FS 270 Y=TC(T,ASC(MID$(M$(I),2
       ,1))-C):Z=TC(T,ASC(RIGH
       T$(M$(I),1))-C)
SF 280 IFX>0THENIFY>0THENIFZ=0
       THENLC=1:I=36
PC 290 NEXT:IFLC=0THEN380
```

```
RF 300 GOTO140
DG 310 SYSP,23,0:PRINTBL$:SYSP
       ,23,13:PRINT"ILLEGAL MO
       VE"
DM 320 FORI=1TO10:POKE54296,15
       :FORJ=1TO2:NEXT:POKE542
       96,0:FORJ=1TO2:NEXT:NEX
       T
MB 330 FORI=1TO250:NEXT:GOTO14
       0
DQ 340 T=T-1:S=S-1:FORI=1TO15
FD 350 IFTC(T,I)=0ANDTC(T+1,I)
       =1THENFORJ=1TO8:POKEP(I
       )+O(J),SP:NEXT
CC 360 IFTC(T,I)=1ANDTC(T+1,I)
       =0THENFORJ=1TO8:POKEP(I
       )+O(J),C(J):NEXT
FM 370 NEXT:GOTO250
XC 380 SYSP,23,0:PRINTBL$:SYSP
       ,23,6:PRINT"GAME OVER -
        YOUR SCORE IS";S
PM 390 FORI=0TO2100:NEXT
PP 400 SYSP,23,0:PRINTBL$:SYSP
       ,23,4:INPUT"PLAY AGAIN
       {SPACE}(Y/N) OR BACKUP
       {SPACE}(←)";A$
RM 410 IFLEFT$(A$,1)="Y"THENSY
       SP,2,1:PRINTBL$:S=0:GOT
       O100
AC 420 IFA$="←"THEN340
MC 430 PRINT"{CLR}":END
BH 440 SYSP,23,0:PRINTBL$:SYSP
       ,23,6:PRINT"CONGRATULAT
       IONS, YOU WON"
BB 450 FORI=1TO20:FORJ=1TO15:P
       OKE53280,J:NEXT:NEXT:PO
       KE53280,6:GOTO400
JS 460 POKEDC+24,15:POKEDC+1,1
       10:POKEDC+5,9:POKEDC+6,
       9:POKEDC+4,17:POKEDC+4,
       16
RE 470 RETURN
KQ 480 DATA 1203,1360,1366,151
       7,1523,1529,1674,1680
XD 490 DATA 1686,1692,1831,183
       7,1843,1849,1855
GB 500 DATA 85,64,73,66,75,64,
       74,66,-41,-40,-39,1,41,
       40,39,-1
MM 510 DATA ABD,ACF,BDG,BEI,CE
       H,CFJ,DEF,DGK,DHM
MF 520 DATA EHL,EIN,FIM,FJO,GH
       I,HIJ,KLM,LMN,MNO
SQ 530 DATA 32,13,192,132,251,
       32,13,192,166,251,76,24
       0
QQ 540 DATA 255,32,253,174,32,
       158,173,32,170,177,96
```

Program 2: Pegs—VIC Version

Note: An 8K or 16K expander is necessary to run this program.

```
DR 10 DIMP(15),O(8),C(8),TC(14
      ,15),M$(36)
PD 20 BL$="":FORI=1TO21:BL$=BL
      $+" ":NEXT:DC=33792:C=64
      :P=828:B=2:SP=32
CH 30 FORI=1TO15:READP(I):NEXT
BD 40 FORI=1TO8:READC(I):NEXT:
      FORI=1TO8:READO(I):NEXT
XR 50 FORI=1TO18:READM$(I)
KF 60 M$(I+18)=RIGHT$(M$(I),1)
      +MID$(M$(I),2,1)+LEFT$(M
      $(I),1):NEXT
MM 70 FORI=PTOP+15:READD:POKEI
      ,D:NEXT
HK 80 PRINT"{CLR}{BLK}";:POKE3
      6879,30
PM 90 PRINT"{RVS}{BLU}
      {9 SPACES}PEGS{9 SPACES}
      {OFF}";
HH 100 SYSP,2,0:PRINT"{BLK}SCO
       RE";S:FORI=1TO15:POKEP(
       I),I:POKEP(I)+DC,0
PQ 110 NEXT:FORI=2TO15:FORJ=1T
       O8:POKEP(I)+O(J),C(J):P
       OKEP(I)+O(J)+DC,B:NEXT:
       NEXT
PP 120 FORI=1TO8:POKEP(1)+O(I)
       +DC,B:POKEP(1)+O(I),SP:
       NEXT
HA 130 T=1:FORI=2TO15:TC(T,I)=
       1:NEXT:TC(T,1)=0:S=0
KX 140 SYSP,21,0:PRINTBL$:SYSP
       ,21,5:PRINT"YOUR MOVE";
AE 150 INPUTA$:IFT>1ANDA$="←"T
       HEN330
EQ 160 IFLEN(A$)<>2THEN310
XE 170 BM=1:FORI=1TO36:IFA$=LE
       FT$(M$(I),1)+RIGHT$(M$(
       I),1)THENBM=0:MC=I:I=36
MA 180 NEXT:IFBM>0THEN310
QM 190 MF=ASC(LEFT$(A$,1))-C:J
       P=ASC(MID$(M$(MC),2,1))
       -C:MT=ASC(RIGHT$(A$,1))
       -C
CH 200 IFTC(T,MF)=0ORTC(T,MT)=
       1ORTC(T,JP)=0THEN310
RB 210 FORI=1TO8:POKEP(MF)+O(I
       ),SP:POKEP(MT)+O(I),C(I
       ):NEXT
PF 220 FORI=1TO8:POKEP(JP)+O(I
       ),SP:NEXT:GOSUB480
GC 230 T=T+1:FORI=1TO15:TC(T,I
       )=TC(T-1,I):NEXT
FQ 240 TC(T,MF)=0:TC(T,MT)=1:T
       C(T,JP)=0:S=S+1
HD 250 SYSP,2,0:PRINT"SCORE";S
       ;"{LEFT} ":IFS=13THENGO
       TO460
FH 260 LC=0:FORI=1TO36:X=TC(T,
       ASC(LEFT$(M$(I),1))-C)
FS 270 Y=TC(T,ASC(MID$(M$(I),2
       ,1))-C):Z=TC(T,ASC(RIGH
       T$(M$(I),1))-C)
SF 280 IFX>0THENIFY>0THENIFZ=0
       THENLC=1:I=36
XD 290 NEXT:IFLC=0THEN370
RF 300 GOTO140
BC 310 SYSP,21,0:PRINTBL$:SYSP
       ,21,5:PRINT"ILLEGAL MOV
       E"
PG 320 POKE36878,15:POKE36874,
       129:FORTD=1TO600:NEXT:P
       OKE36878,0:POKE36874,0:
       GOTO140
HR 330 T=T-1:S=S-1:FORI=1TO15
KD 340 IFTC(T,I)=0ANDTC(T+1,I)
       =1THENFORJ=1TO8:POKEP(I
       )+O(J),SP:NEXT
GD 350 IFTC(T,I)=1ANDTC(T+1,I)
       =0THENFORJ=1TO8:POKEP(I
       )+O(J),C(J):NEXT
KF 360 NEXT:GOTO250
FB 370 SYSP,21,0:PRINTBL$:SYSP
       ,21,7:PRINT"GAME OVER":
       PRINT"{3 SPACES}YOUR SC
       ORE IS";S;
HM 380 FORI=0TO4100:NEXT
JP 390 SYSP,21,0:PRINTBL$:SYSP
       ,21,2:PRINT" PLAY AGAIN
        (Y/N)"
AM 400 PRINT"{4 SPACES}OR BACK
       UP (←)? {LEFT}";
DS 410 POKE198,0:WAIT198,1:GET
       A$
KM 420 IFA$="Y"THENS=0:GOTO80
SQ 430 IFA$="←"THENSYSP,22,0:P
       RINTBL$;:GOTO330
QX 440 IFA$<>"N"THEN410
CA 450 PRINT"{CLR}":END
JP 460 SYSP,21,0:PRINTBL$:SYSP
       ,21,6:PRINT"YOU WON"
RK 470 FOR Q1=1TO20:FORQ2=24TO
       30:POKE36879,Q2:NEXTQ2,
       Q1:GOTO390
KH 480 POKE36876,180:FORA=15TO
       0STEP-.3:POKE36878,A:NE
       XT:POKE36876,0:RETURN
RB 490 DATA 4150,4236,4240,432
       2,4326,4330,4408,4412,4
       416,4420
HD 500 DATA 4494,4498,4502,450
       6,4510
MK 510 DATA 85,64,73,72,75,64,
       74,66,-23,-22,-21,1,23,
       22,21,-1
SP 520 DATA ABD,ACF,BDG,BEI,CE
       H,CFJ,DEF,DGK,DHM
GE 530 DATA EHL,EIN,FIM,FJO,GH
       I,HIJ,KLM,LMN,MNO
SF 540 DATA 32,155,215,138,72,
       32,155,215,138,168,104,
       170,24,76,240,255
```

Program 3: Pegs—Plus/4 and 16 Version

```
HB 10 DIMP(15),O(8),C(8),TC(14
      ,15),M$(36):Z1=65305:Z2=
      65301
KH 20 BL$="":FORI=1TO39:BL$=BL
      $+" ":NEXT:DC=-1024:C=64
      :B=66:SP=32
CH 30 FORI=1TO15:READP(I):NEXT
BD 40 FORI=1TO8:READC(I):NEXT:
      FORI=1TO8:READO(I):NEXT
XR 50 FORI=1TO18:READM$(I)
KF 60 M$(I+18)=RIGHT$(M$(I),1)
      +MID$(M$(I),2,1)+LEFT$(M
      $(I),1):NEXT
MP 70 PRINT"{CLR}{BLK}";:POKEZ
      1,70
AQ 80 PRINT"{RVS}{BLU}
      {18 SPACES}PEGS
      {18 SPACES}{OFF}";
DD 90 CHAR 1,1,2,"":PRINT"
      {BLK}SCORE:";S:FORI=1TO1
      5:POKEP(I),I:POKEP(I)+DC
      ,0
HQ 100 NEXT:FORI=2TO15:FORJ=1T
       O8:POKEP(I)+O(J),C(J):P
       OKEP(I)+O(J)+DC,B:NEXT:
       NEXT
XM 110 FORI=1TO8:POKEP(1)+O(I)
       +DC,B:POKEP(1)+O(I),SP:
       NEXT
CX 120 T=1:FORI=2TO15:TC(T,I)=
       1:NEXT:TC(T,1)=0:S=0
SA 130 CHAR 1,0,23,"":PRINTBL$
       :CHAR1,14,23,"":PRINT"Y
       OUR MOVE";
JH 140 INPUTA$:IFT>1ANDA$="-"T
       HEN330
FS 150 IFLEN(A$)<>2THEN300
PH 160 BM=1:FORI=1TO36:IFA$=LE
       FT$(M$(I),1)+RIGHT$(M$(
       I),1)THENBM=0:MC=I:I=36
MC 170 NEXT:IFBM>0THEN300
JR 180 MF=ASC(LEFT$(A$,1))-C:J
       P=ASC(MID$(M$(MC),2,1))
       -C:MT=ASC(RIGHT$(A$,1))
       -C
JF 190 IFTC(T,MF)=0ORTC(T,MT)=
       1ORTC(T,JP)=0THEN300
BB 200 FORI=1TO8:POKEP(MF)+O(I
       ),SP:POKEP(MT)+O(I),C(I
       ):NEXT
KQ 210 FORI=1TO8:POKEP(JP)+O(I
       ),SP:NEXT:GOSUB450
```

```
MF 220 T=T+1:FORI=1TO15:TC(T,I
       )=TC(T-1,I):NEXT
KR 230 TC(T,MF)=0:TC(T,MT)=1:T
       C(T,JP)=0:S=S+1
SX 240 CHAR1,1,2,"":PRINT"SCOR
       E:";S;"{LEFT} ":IFS=13T
       HENGOTO430
KH 250 LC=0:FORI=1TO36:X=TC(T,
       ASC(LEFT$(M$(I),1))-C)
KS 260 Y=TC(T,ASC(MID$(M$(I),2
       ,1))-C):Z=TC(T,ASC(RIGH
       T$(M$(I),1))-C)
ME 270 IFX>0THENIFY>0THENIFZ=0
       THENLC=1:I=36
QQ 280 NEXT:IFLC=0THEN370
XF 290 GOTO130
EJ 300 CHAR 1,0,23,"":PRINTBL$
       :CHAR1,13,23,"":PRINT"I
       LLEGAL MOVE"
KE 310 VOL8:SOUND 1,0,20
AD 320 FORI=1TO250:NEXT:GOTO13
       0
HR 330 T=T-1:S=S-1:FORI=1TO15
KD 340 IFTC(T,I)=0ANDTC(T+1,I)
       =1THENFORJ=1TO8:POKEP(I
       )+O(J),SP:NEXT
GD 350 IFTC(T,I)=1ANDTC(T+1,I)
       =0THENFORJ=1TO8:POKEP(I
       )+O(J),C(J):NEXT
PE 360 NEXT:GOTO240
GK 370 CHAR1,0,23,"":PRINTBL$:
       CHAR 1,6,23,"":PRINT"GA
       ME OVER - YOUR SCORE IS
       ";S
XP 380 FORI=0TO2100:NEXT
JF 390 CHAR1,0,23,"":PRINTBL$:
       CHAR1,4,23,"":INPUT"PLA
       Y AGAIN (Y/N) OR BACKUP
        (-)";A$
AE 400 IFLEFT$(A$,1)="Y"THENCH
       AR1,1,2,"":PRINTBL$:S=0
       :GOTO70
SR 410 IFA$="-"THEN330
XR 420 PRINT"{CLR}":END
GS 430 CHAR 1,0,23,"":PRINTBL$
       :CHAR 1,6,23,"":PRINT"C
       ONGRATULATIONS, YOU WON
       "
DP 440 FORI=1TO20:FORJ=1TO15:P
       OKEZ1,J+80:NEXT:NEXT:PO
       KEZ1,70:GOTO390
ES 450 SOUND 1,960,30:FOR A=8
       {SPACE}TO 1 STEP-.2:VOL
        A:NEXT
KD 460 RETURN
XQ 470 DATA 3251,3408,3414,356
       5,3571,3577,3722,3728
GJ 480 DATA 3734,3740,3879,388
       5,3891,3897,3903
RB 490 DATA 85,64,73,66,75,64,
       74,66,-41,-40,-39,1,41,
       40,39,-1
GM 500 DATA ABD,ACF,BDG,BEI,CE
       H,CFJ,DEF,DGK,DHM
SG 510 DATA EHL,EIN,FIM,FJO,GH
       I,HIJ,KLM,LMN,MNO
```

Q-Bird

See instructions in article on page 46 before typing in.

```
0801:0B 08 00 00 9E 32 30 36 EC
0809:31 00 00 00 A9 00 8D 20 3A
0811:D0 20 CF 14 20 1B 08 4C 96
0819:C7 0B A9 93 20 D2 FF A9 34
0821:08 20 D2 FF A9 8E 20 D2 32
0829:FF A9 04 85 02 A9 0E 38 87
0831:E5 02 EA EA 85 D3 A5 02 89
0839:85 D6 20 10 E5 A0 06 A2 27
0841:0E BD 63 08 20 D2 FF CA CB
0849:10 F7 88 10 F2 A9 0D 20 E9
0851:D2 FF 20 D2 FF E6 02 E6 82
0859:02 A5 02 C9 10 D0 CE 4C 5E
0861:73 08 1D 91 B7 B7 98 9D 55
0869:9D 9D 11 A9 92 20 A9 12 E6
0871:05 00 A0 09 A9 00 85 02 03
0879:A6 02 BD B0 08 C9 FF F0 78
0881:08 20 D2 FF E6 02 4C 79 49
0889:08 88 10 03 4C C6 13 E8 7E
0891:E6 02 BD B0 08 85 D3 E8 3F
0899:E6 02 BD B0 08 85 D6 48 AC
08A1:8A 48 98 48 20 10 E5 68 16
08A9:A8 68 AA 68 4C 85 08 FF 8C
08B1:21 05 1C 1F 1F 1F 1F 1F DB
08B9:1F FF 21 06 1F 1F 1F 1F B0
08C1:1F 1F FF 23 08 1F 1F 1F 75
08C9:FF 22 0A FF 21 0C 1F 91 AC
08D1:91 91 51 2D 42 49 52 44 2C
08D9:FF 04 11 1E 48 49 53 43 40
08E1:4F 52 45 3A 99 30 30 30 98
08E9:30 30 FF 05 13 1E 53 43 69
08F1:4F 52 45 3A 99 30 30 30 A8
08F9:30 30 FF 19 11 1E 4C 45 9E
0901:56 45 4C 3A 99 30 31 FF AC
0909:19 13 1E 4C 49 56 45 53 76
0911:3A 99 FF A9 97 20 D2 FF 24
0919:A0 02 A9 A4 20 31 09 A0 F3
0921:10 A9 A3 20 31 09 A0 14 1F
0929:A9 A4 20 31 09 4C 45 09 5D
0931:84 D6 A0 00 84 D3 48 20 73
0939:10 E5 68 A2 26 20 D2 FF 5B
0941:CA 10 FA 60 A9 1F 85 D3 CA
0949:A9 03 85 D6 20 10 E5 A2 BE
0951:0C A9 A7 20 D2 FF A9 9D 52
0959:20 D2 FF A9 11 20 D2 FF 79
0961:CA 10 EE 60 00 00 A9 FF 14
0969:8D 1C D0 A9 00 8D 15 D0 2F
0971:8D 1D D0 8D 17 D0 A9 07 DA
0979:8D 25 D0 4C 80 0B 00 03 AD
0981:C0 00 0E B0 F0 3A AF AC 3D
0989:36 6A AC D6 AA B0 3A AA 8B
0991:B0 0E AA C0 03 67 00 03 99
0999:77 00 0D DD C0 03 33 00 5F
09A1:00 00 00 00 00 00 00 00 B3
09A9:00 00 00 00 00 00 00 00 BB
09B1:00 00 00 00 00 00 00 00 C3
09B9:00 00 00 00 00 00 00 03 CE
09C1:C3 00 0E BE F0 3A AA EC 16
09C9:D6 6B AC 36 AB B0 DA AE 9F
09D1:B0 3E AA C0 03 67 00 03 E5
09D9:77 00 03 77 00 0D DD C0 30
09E1:03 33 00 00 00 00 00 00 42
09E9:00 00 00 00 00 00 00 00 FB
09F1:00 00 00 00 00 00 00 00 04
09F9:00 00 00 00 00 00 00 00 0C
0A01:0F 00 3C 3A C0 EB EA B0 04
0A09:EA A6 70 3A AA 5C 3A AA D3
0A11:B0 0E AA C0 03 67 00 03 1B
0A19:77 00 0D DD C0 03 33 00 E0
0A21:00 00 00 00 00 00 00 00 35
0A29:00 00 00 00 00 00 00 00 3D
0A31:00 00 00 00 00 00 00 00 45
0A39:00 00 00 00 00 00 00 03 50
0A41:0F 00 3E FA C0 EE AA B0 1C
0A49:EB A6 5C 3B AA 70 3A EA B2
0A51:9C 0E AA F0 03 67 00 03 54
0A59:77 00 03 77 00 0D DD C0 B1
0A61:03 33 00 00 00 00 00 00 C3
0A69:00 00 00 00 00 00 00 00 7D
0A71:00 00 00 00 00 00 00 00 85
0A79:00 00 00 00 00 00 00 03 90
0A81:C0 00 0E B0 00 36 6C 00 74
0A89:EA AC 00 FE AC 00 EA AC 16
0A91:00 3E B0 00 EA AC 00 35 8A
0A99:AC 00 0D AC 00 0D AC 00 FD
0AA1:0D AC 00 3A AC 00 EA B0 F6
0AA9:00 3E B0 00 0E B0 00 03 99
0AB1:AC 00 00 F0 00 00 00 00 2B
0AB9:00 00 00 00 00 00 00 03 D0
0AC1:C0 00 0E B0 00 36 6C 00 B4
0AC9:EA AC 00 EA AC 00 3A B0 B7
0AD1:00 0E AC 00 3A AC 00 E5 69
0AD9:AC 00 3D AC 00 0D AC 00 44
0AE1:0D AC 00 3A B0 00 EA B0 57
0AE9:00 EE B0 00 3E B0 00 03 87
0AF1:B0 00 00 C0 00 00 00 00 6A
0AF9:00 00 00 00 00 00 00 0F 1D
0B01:00 00 3A C0 00 E6 70 00 E6
0B09:EA AC 00 EA FC 00 EA AC D8
0B11:00 3A F0 00 EA AC 00 E9 C7
0B19:70 00 E9 C0 00 E9 C0 00 D9
0B21:E9 C0 00 EA B0 00 3A AC B1
0B29:00 3A F0 00 3A C0 00 EB AC
0B31:00 00 3C 00 00 00 00 00 CE
0B39:00 00 00 00 00 00 00 0F 5E
0B41:00 00 3A C0 00 E6 70 00 27
0B49:EA AC 00 EA AC 00 3A B0 39
0B51:00 EA C0 00 EA B0 00 E9 3E
0B59:6C 00 E9 F0 00 E9 C0 00 1B
0B61:E9 C0 00 3A B0 00 3A AC E6
0B69:00 3A EC 00 3A F0 00 3B 7C
0B71:00 00 0C 00 00 00 00 00 09
0B79:00 00 00 00 00 00 00 A9 39
0B81:00 8D 26 D0 A2 07 BD 99 13
0B89:0B 9D 27 D0 BD A1 0B 9D A6
0B91:F8 07 CA 10 F1 4C A9 0B 5F
0B99:05 04 04 04 09 02 06 0E 5E
0BA1:80 2C 2A 2C 3E 3C 26 82 BC
0BA9:A2 0F BD B7 0B 9D 00 D0 A7
0BB1:CA 10 F7 60 00 00 78 66 8D
0BB9:6D 47 FD 47 1D 97 00 00 D3
0BC1:00 00 A9 9E 00 00 20 67 9E
0BC9:09 4C A0 12 4C 55 19 AD 44
0BD1:34 03 C9 07 D0 0F A9 00 82
0BD9:8D 34 03 EE 35 03 AD 35 59
0BE1:03 C9 05 F0 03 4C 08 16 0B
0BE9:20 3A 0C C9 00 F0 03 4C D2
0BF1:C4 11 20 DB 11 29 0F 49 05
0BF9:0F 85 03 29 01 C9 01 D0 ED
0C01:08 A9 00 8D 66 0C 4C 97 F3
0C09:0C A5 03 29 02 C9 02 D0 8F
0C11:08 A9 20 8D 66 0C 4C 97 08
0C19:0C A5 03 29 04 C9 04 D0 B3
0C21:08 A9 40 8D 66 0C 4C 97 1C
0C29:0C A5 03 29 08 C9 08 D0 EB
0C31:B4 A9 60 8D 66 0C 4C 97 86
0C39:0C A9 00 8D 35 03 AD 36 E1
0C41:03 60 8D 21 D0 A9 00 A2 86
0C49:CB 9D 34 03 CA E0 FF D0 10
0C51:F8 60 EE 36 03 AE 36 03 81
0C59:E0 1A D0 08 A9 00 8D 36 A1
0C61:03 4C 46 16 BD 20 0D AA 6B
0C69:BD 80 0C 18 6D 0C D0 8D 4E
0C71:0C D0 BD 8B 0C 18 6D 0D DC
0C79:D0 8D 0D D0 4C 04 18 00 AE
0C81:00 00 00 FF FF FF 00 01 9A
0C89:01 01 00 FF 01 00 00 FF 6A
0C91:01 00 00 FF 01 00 AD 66 F3
0C99:0C C9 00 F0 0C C9 60 F0 72
0CA1:08 A9 27 8D FE 07 4C 53 E5
0CA9:0C A9 29 8D FE 07 4C 53 30
0CB1:0C CE FE 07 4C E6 0B A9 91
0CB9:04 85 FE A0 00 84 FD A2 CF
0CC1:04 AD 3A 03 18 65 FD 85 96
0CC9:FD A5 FE 69 00 85 FE CA 9F
0CD1:10 EF A5 FD 18 6D 3B 03 72
0CD9:85 FD A5 FE 69 00 85 FE 2E
0CE1:60 00 00 AD 0D D0 38 E9 0B
0CE9:31 8D 3A 03 AD 0C D0 4A FE
0CF1:4A 4A 18 69 0C 8D 3B 03 6B
0CF9:20 B8 0C 4C 99 0D 00 00 97
0D01:01 01 01 01 01 01 01 01 1B
0D09:09 09 09 09 09 09 09 09 23
0D11:08 08 08 08 08 08 08 08 2B
0D19:00 00 00 00 00 00 00 00 33
0D21:04 04 04 04 04 04 04 04 3B
0D29:06 06 06 06 06 06 06 06 43
0D31:02 02 02 02 02 02 02 02 4B
0D39:00 00 00 00 00 00 00 00 53
0D41:05 05 05 05 05 05 05 05 5B
0D49:04 04 04 04 04 04 04 04 63
0D51:06 06 06 06 06 06 06 06 6B
0D59:00 00 00 00 00 00 00 00 73
0D61:09 09 09 09 09 09 09 09 7B
0D69:08 08 08 08 08 08 08 08 83
```

```
0D71:0A 0A 0A 0A 0A 0A 0A 0A 8B
0D79:00 00 00 00 00 00 00 A5 39
0D81:FE 18 69 D4 85 FE A0 02 07
0D89:B1 FD 4C 68 12 20 30 17 94
0D91:91 FD 88 10 F3 4C B2 0C 48
0D99:B1 FD C9 E9 F0 E1 4C 78 04
0DA1:14 EE 37 03 AD 37 03 C9 B2
0DA9:02 D0 2C A9 00 8D 37 03 C0
0DB1:EE 38 03 AD 38 03 C9 01 EE
0DB9:D0 1D A9 00 8D 38 03 A2 AE
0DC1:01 FE 3C 03 BD 3C 03 DD 96
0DC9:DB 0D D0 08 A9 00 9D 3C 74
0DD1:03 20 00 0E 4C E5 0E 60 CC
0DD9:2E 11 18 18 1C 20 00 00 35
0DE1:00 A2 18 A9 00 9D 00 D4 8D
0DE9:CA 10 FA A9 FF 8D 0F D4 90
0DF1:A9 80 8D 12 D4 A9 00 4C 6D
0DF9:AE 17 00 00 00 00 00 BD EE
0E01:40 03 C9 00 D0 0D 20 81 B3
0E09:0E 29 03 0A 0A 0A 0A 0A 0E
0E11:20 54 0E BD 50 03 8D 6E 08
0E19:0E FE 40 03 BC 40 03 C0 E1
0E21:1E D0 09 A9 00 9D 40 03 36
0E29:EA EA EA 60 86 05 06 05 32
0E31:8E 4F 03 EA 20 6D 0E AA F4
0E39:A4 05 BD 80 0C 18 79 00 5C
0E41:D0 99 00 D0 BD 8B 0C 18 85
0E49:79 01 D0 99 01 D0 AE 4F 0E
0E51:03 60 00 9D 50 03 C9 00 03
0E59:F0 0A C9 60 F0 06 A9 2B CD
0E61:9D F8 07 60 A9 2D 9D F8 A7
0E69:07 60 00 00 B9 60 0D C9 54
0E71:00 D0 0A 48 BD F8 07 29 90
0E79:FE 9D F8 07 68 60 00 00 D0
0E81:EA EA EA 20 DC 0E AD 3A E1
0E89:03 38 E9 2C 8D 3A 03 AD 3E
0E91:3B 03 4A 4A 4A 18 69 0C 8B
0E99:8D 3B 03 86 FC 20 B8 0C F9
0EA1:A6 FC A0 00 B1 FD C9 E9 67
0EA9:D0 D9 AD FF 03 60 00 86 7A
0EB1:05 20 D5 17 29 03 8D FF F4
0EB9:03 AA BD D4 0E 18 79 01 CB
0EC1:D0 8D 3A 03 BD D8 0E 18 A6
0EC9:79 00 D0 8D 3B 03 A6 05 CD
0ED1:60 00 00 F2 12 02 02 12 FB
0ED9:F2 EA 1A 86 05 06 05 A4 C4
0EE1:05 4C B0 0E E8 E0 04 F0 4E
0EE9:03 4C C2 0D 4C D8 0D A2 46
0EF1:BF BD 00 10 9D 00 20 CA 56
0EF9:E0 FF D0 F5 4C E2 0D 00 08
0F01:FC 00 03 AB 00 0E 5A C0 66
0F09:39 AA B0 3A AA B0 EA A9 BF
0F11:AC EA AA AC EA AA AC 39 F4
0F19:AA B0 39 69 B0 0E 56 C0 A1
0F21:03 AB 00 00 FC 00 00 00 93
0F29:00 00 00 00 00 00 00 00 47
0F31:00 00 00 00 00 00 00 00 4F
0F39:00 00 00 00 00 00 00 00 57
0F41:FC 00 03 AB 00 0E 96 C0 1F
0F49:3A A9 B0 3A AA B0 EA AA 41
0F51:AC EA AA AC EA AA AC 39 35
0F59:AA B0 39 6A B0 0E 5A C0 F9
0F61:03 AB 00 00 FC 00 00 00 D3
0F69:00 00 00 00 00 00 00 00 87
0F71:00 00 00 00 00 00 00 00 8F
0F79:00 00 00 00 00 00 00 00 97
0F81:00 00 00 00 00 00 00 00 9F
0F89:03 F3 FC 3E AE AB EF FA A8
0F91:65 EA AA A9 EA EA AF 3F AE
0F99:AA F0 3A AF 00 0F F0 00 A9
0FA1:00 00 00 00 00 00 00 00 BF
0FA9:00 00 00 00 00 00 00 00 C7
0FB1:00 00 00 00 00 00 00 00 CF
0FB9:00 00 00 00 00 00 00 00 D7
0FC1:00 00 00 00 00 0F C0 00 9D
0FC9:3A BC 00 0E AB FC 3F AE 93
0FD1:AB EF FA 65 EA AA A9 EA B7
0FD9:EA AF 3F AA F0 0E AB 00 03
0FE1:0E AC 00 3A F0 00 0F 00 7B
0FE9:00 00 00 00 00 00 00 00 08
0FF1:00 00 00 00 00 00 00 00 10
0FF9:00 00 00 00 00 00 00 00 18
1001:00 00 00 FC 00 03 AB 00 54
1009:0E 66 C0 3E AA F0 35 A9 F2
1011:70 35 99 70 0D 55 C0 03 33
1019:57 00 03 9B 00 03 AB 00 62
1021:0E 6C 00 0E AF C0 39 BE F5
1029:B0 3A BA C0 39 BE B0 0E C7
1031:AA B0 0E 6A C0 03 AB 00 A4
1039:00 FC 00 00 00 00 00 03 9B
1041:FF 00 0E 66 C0 3A AA B0 7E
1049:35 99 70 35 55 70 0D 55 A7
1051:C0 03 57 00 03 9B 00 03 07
1059:9B 00 03 AB 00 03 9B 00 A5
1061:0E AC 00 0E 6C 00 0E AC C0
1069:00 0E 6C 00 0E AC 00 03 C0
1071:6B 00 03 AB 00 03 9B 00 A5
1079:00 EA C0 00 3F 00 00 00 66
1081:00 00 00 00 00 00 30 00 02
1089:00 EC 00 03 AB 00 03 6B E3
1091:00 03 6B 00 03 5B 00 03 68
1099:9B 00 00 FC 00 00 00 00 57
10A1:00 00 00 00 00 00 00 00 C1
10A9:00 00 00 00 00 00 00 00 C9
10B1:00 00 00 00 00 00 00 00 D1
10B9:00 00 00 00 00 00 00 AD 87
10C1:01 D0 18 69 08 38 ED F6 24
10C9:03 F0 08 90 03 A9 00 60 D0
10D1:A9 20 60 AD 00 D0 18 69 92
10D9:02 38 ED F5 03 90 03 A9 30
10E1:40 60 A9 60 60 00 00 AD 26
10E9:F0 03 C9 00 D0 06 20 4F AA
10F1:11 8D 00 11 EE F0 03 AE FE
10F9:F0 03 E0 20 F0 27 BD 20 31
1101:0D AA C9 00 D0 08 AD F8 88
1109:07 29 80 8D F8 07 BD 80 C1
1111:0C 18 6D 00 D0 8D 00 D0 7A
1119:BD 8B 0C 18 6D 01 D0 8D 9E
1121:01 D0 4C 69 11 A9 00 8D D4
1129:F0 03 4C 23 11 EE F1 03 6B
1131:AD F1 03 C9 0A D0 EB A9 B8
1139:00 8D F1 03 EE F2 03 AD 24
1141:F2 03 C9 05 D0 DC A9 00 74
1149:8D F2 03 4C E8 10 A9 81 70
1151:8D F8 07 4C C0 10 AD 0C CB
1159:D0 8D F5 03 AD 0D D0 8D 07
1161:F6 03 AD 00 DC 60 00 00 DD
1169:EE FA 03 AD FA 03 C9 06 7A
1171:D0 0F A9 00 8D FA 03 EE 42
1179:FB 03 AD FB 03 C9 05 F0 0A
1181:28 4C ED 11 A9 00 8D FB FD
1189:03 EE 08 D0 AD 08 D0 C9 EF
1191:01 D0 EE 20 D5 17 29 07 AC
1199:C9 06 B0 F7 0A 0A 0A 0A 4E
11A1:18 69 4C 8D 09 D0 4C 82 33
11A9:11 EE FC 03 AD FC 03 C9 11
11B1:20 D0 D1 AD FC 07 49 01 C4
11B9:8D FC 07 A9 00 8D FC 03 90
11C1:4C 85 11 AD FE 03 C9 01 01
11C9:F0 03 4C 53 0C EE FD 03 FE
11D1:AD FD 03 29 01 F0 F3 4C 3D
11D9:56 0C A9 00 8D FE 03 AD 7B
11E1:00 DC 29 10 D0 03 EE FE D0
11E9:03 4C 57 11 EE F3 03 AD 97
11F1:F3 03 C9 05 D0 0F A9 00 6E
11F9:8D F3 03 EE F4 03 AD F4 33
1201:03 C9 0A F0 03 4C CD 0B 59
1209:A9 00 8D F4 03 EE 0B D0 BD
1211:4C 3D 12 C9 01 F0 0A C9 33
1219:48 90 03 20 4C 12 4C 06 31
1221:12 20 D5 17 29 07 C9 07 82
1229:B0 F7 AA A9 00 18 69 18 DE
1231:CA 10 FA 18 69 58 8D 0A 71
1239:D0 4C 1C 12 AD 0B D0 C9 82
1241:A8 D0 D0 A9 01 8D 0B D0 C7
1249:4C 22 12 CE 0A D0 EE EF AC
1251:03 AD EF 03 C9 08 D0 0D AD
1259:AD FD 07 49 01 8D FD 07 8A
1261:A9 00 8D EF 03 60 00 29 CD
1269:0F C9 02 D0 03 4C 96 0D 58
1271:85 04 E6 04 C9 01 EA D0 6F
1279:0D EE D0 03 AD D0 03 C9 AA
1281:7E D0 03 4C 8A 12 4C 8E 02
1289:0D A5 04 91 FD 4C 47 17 FD
1291:AD E1 03 8D 76 12 8D 6B C0
1299:12 4C B7 13 60 00 00 A9 AE
12A1:06 85 D3 A9 16 85 D6 20 D3
12A9:10 E5 A2 00 BD BB 12 20 C4
12B1:D2 FF E8 E0 3D D0 F5 4C CF
12B9:6A 15 08 8E 9E 55 53 45 78
12C1:20 53 54 49 43 4B 20 54 C5
12C9:4F 20 53 45 4C 45 43 54 AE
12D1:20 4C 45 56 45 4C 0D 20 BC
12D9:00 00 00 20 20 20 20 20 E1
12E1:20 50 52 45 53 53 20 54 45
12E9:52 49 47 47 45 52 20 54 EE
12F1:4F 20 53 54 41 52 54 00 71
12F9:00 20 77 15 29 10 D0 0B 9C
1301:20 72 13 A9 40 8D 15 D0 04
1309:4C 5B 17 AD 00 DC 29 0F BE
1311:49 0F 29 03 C9 01 D0 0D F5
1319:AD E1 03 C9 0F F0 DA EE 6C
1321:E1 03 4C 34 13 C9 02 D0 5A
1329:D0 AD E1 03 C9 02 90 C9 D0
1331:CE E1 03 AD E1 03 C9 0A 2B
1339:B0 0E 18 69 30 8D C8 06 24
1341:A9 30 8D C7 06 4C FA 12 DF
1349:18 69 26 8D C8 06 A9 31 56
1351:8D C7 06 4C FA 12 00 EE C4
1359:E3 03 D0 FB EE E4 03 AD CA
1361:E4 03 C9 FF D0 F6 A9 08 B1
1369:8D E4 03 AD 00 DC 60 00 FE
1371:00 A2 27 A9 20 9D 70 07 1F
1379:9D 98 07 CA 10 F7 60 00 43
1381:00 20 91 12 4C A7 13 EE 19
1389:E3 03 D0 FB EE E4 03 D0 1E
1391:F6 EE E5 03 AD E5 03 C9 B0
1399:02 D0 EC A9 00 8D E5 03 32
13A1:8D 15 D0 4C D3 13 AD E1 DA
13A9:03 C9 00 D0 03 EE E1 03 6B
13B1:20 91 12 4C E0 13 EE 6B EF
13B9:12 C9 0F D0 05 A9 00 8D A6
13C1:6B 12 60 00 00 A9 30 20 55
13C9:D2 FF A9 35 20 D2 FF 4C 7A
13D1:14 09 20 1B 08 AD E1 03 B7
13D9:C9 0F F0 03 EE E1 03 A9 A5
13E1:60 8D 46 13 8D 54 13 20 99
13E9:34 13 A9 4C 8D 46 13 8D 22
13F1:54 13 20 17 14 20 E4 16 7D
13F9:A9 FF 8D 15 D0 AD E1 03 FB
1401:85 04 A9 00 A2 CB 9D 34 D5
1409:03 CA E0 FF D0 F8 A5 04 3B
1411:8D E1 03 4C 91 15 A9 0E DF
1419:85 D3 A9 16 85 D6 20 23 7A
1421:15 A2 00 20 4C 14 E8 E0 E3
1429:0B D0 F8 A9 60 8D A1 13 54
1431:20 88 13 A9 8D 8D A1 13 81
1439:20 DC 14 4C 91 12 9E 47 49
1441:45 54 20 52 45 41 44 59 5B
1449:00 00 00 BD 3F 14 4C D2 03
1451:FF EE D4 03 D0 FB EE D5 2A
1459:03 AD D5 03 C9 03 D0 F1 47
1461:A9 00 8D D5 03 20 3A 18 92
1469:AD 0D D0 C9 FF D0 E2 A9 15
1471:00 8D 1B D0 4C 9D 14 A9 18
1479:40 8D 1B D0 4C 52 14 8D F6
1481:15 D0 AD D0 03 85 FC A9 FC
1489:60 8D 14 14 20 E0 13 A9 5D
1491:4C 8D 14 14 A5 FC 8D D0 14
1499:03 4C CD 0B 8D 15 D0 AD D0
14A1:18 07 C9 30 D0 15 AD 17 21
14A9:07 C9 30 D0 03 4C 29 15 8B
14B1:A9 39 8D 18 07 CE 17 07 D8
14B9:4C BF 14 CE 18 07 20 8D 12
14C1:19 8D C7 13 AD 18 07 8D 6D
14C9:CC 13 4C 83 14 00 A9 30 03
14D1:8D C7 13 A9 35 8D CC 13 3C
14D9:4C F0 0E A9 0C 85 D3 A9 88
14E1:16 85 D6 20 10 E5 A2 00 B0
14E9:BD F7 14 20 D2 FF E8 E0 BC
14F1:17 D0 F5 4C 10 15 05 43 7F
14F9:48 41 4E 47 45 20 54 4F 77
1501:20 12 E9 20 92 E9 11 9D FA
1509:9D 9D 98 B7 B7 00 00 AD 63
1511:E1 03 18 69 01 8D 86 DB AD
1519:8D 87 DB 8D 88 DB 60 00 B4
1521:00 00 20 72 13 4C 10 E5 46
1529:20 72 13 A9 0E 85 D3 A9 D4
1531:16 85 D6 20 10 E5 A2 00 02
```

```
1539:BD 5E 15 20 D2 FF E8 E0 C7
1541:0A D0 F5 EE D7 03 D0 FB BA
1549:EE D8 03 D0 F6 EE D9 03 B8
1551:AD D9 03 C9 05 D0 EC A2 AD
1559:00 9A 4C 0D 08 9F 47 41 13
1561:4D 45 20 4F 56 45 52 00 E8
1569:00 A9 0E 8D 15 D0 A9 60 38
1571:8D D8 0D 4C FA 12 20 A2 02
1579:0D EE EC 03 D0 F8 EE ED E9
1581:03 AD ED 03 C9 09 D0 EE 89
1589:A9 00 8D ED 03 4C 5D 13 30
1591:A9 4C 8D D8 0D A9 10 38 4A
1599:ED E1 03 4A 8D AE 15 EE 78
15A1:AE 15 4C CD 0B 00 EE C1 C6
15A9:03 AD C1 03 C9 08 D0 F6 30
15B1:A9 00 8D C1 03 EE 34 03 BD
15B9:4C D0 0B 20 44 19 29 F8 73
15C1:18 69 06 8D 0D 50 20 D5 AB
15C9:17 29 F8 18 69 01 8D 0C E0
15D1:50 20 E4 0C A0 00 B1 FD EF
15D9:C9 E9 D0 DF AD 0C 50 8D 47
15E1:0E D0 AD 0D 50 8D 0F D0 75
15E9:A9 4C 8D FC 0C 4C F9 15 18
15F1:A9 60 8D FC 0C 4C 3B 16 A8
15F9:A9 D0 8D EF 0C 8D E6 0C 4E
1601:4C CD 0B 00 00 00 00 AD D5
1609:C5 03 C9 00 F0 03 4C 6C AA
1611:16 EE CA 03 AD CA 03 C9 F5
1619:70 D0 16 20 F9 16 AD CB C5
1621:03 C9 00 D0 0C AD 0F D0 54
1629:C9 00 F0 08 A9 00 8D 0F 50
1631:D0 4C 98 16 20 F1 15 4C 8C
1639:32 16 A9 50 8D EF 0C 8D 10
1641:E6 0C 4C BC 15 AD 0C D0 81
1649:38 ED 0E D0 C9 00 D0 18 E3
1651:AD 0D D0 38 ED 0F D0 C9 4C
1659:00 D0 0D 20 68 17 A9 7F CF
1661:8D C5 03 A9 00 8D 0F D0 E5
1669:4C E4 0C EE C6 03 AD C6 C9
1671:03 D0 21 EE C7 03 AD C7 D3
1679:03 C9 16 D0 17 A9 00 8D 56
1681:C7 03 EE C8 03 20 7A 19 63
1689:C9 10 D0 08 A9 00 8D C8 6A
1691:03 8D C5 03 4C 04 17 EE 1B
1699:2E D0 EA EA EA A2 0A BD D0
16A1:00 D0 18 7D C8 16 38 ED D9
16A9:0C D0 C9 05 B0 12 BD 01 E3
16B1:D0 18 7D C9 16 38 ED 0D 13
16B9:D0 C9 05 B0 03 4C A6 17 1A
16C1:CA CA 10 DB 4C A2 0D 04 D0
16C9:0B FF 0A FF 0A FF 0A 05 26
16D1:05 03 04 A9 60 8D A1 13 EB
16D9:20 32 18 A9 8D 8D A1 13 39
16E1:4C 78 14 EE CC 13 AD CC 9E
16E9:13 C9 3A D0 08 A9 30 8D 3B
16F1:CC 13 EE C7 13 4C 80 0B 79
16F9:A9 00 8D CA 03 EE CB 03 C7
1701:60 00 00 EE C1 03 AD C1 85
1709:03 C9 04 D0 08 A9 00 8D 2D
1711:C1 03 4C CD 0B 4C 08 16 F6
1719:A2 03 FE 03 07 BD 03 07 A5
1721:C9 3A D0 08 A9 30 9D 03 A9
1729:07 CA 10 EE 4C 4D 17 C0 05
1731:00 D0 0E 84 FC A4 04 20 40
1739:19 17 88 C0 01 D0 F8 A4 B8
1741:FC A5 04 60 00 00 20 30 4E
1749:17 4C 88 13 A2 04 BD 03 FB
1751:07 9D F6 08 CA 10 F7 4C 9C
1759:70 17 A2 04 A9 30 9D 03 66
1761:07 CA 10 FA 4C 82 13 A2 AC
1769:02 20 1B 17 60 00 00 A2 1B
1771:00 38 BD B4 06 FD 03 07 E5
1779:30 09 E9 01 10 13 E8 E0 CE
1781:05 D0 EE A2 04 BD 03 07 92
1789:9D B4 06 9D E6 08 CA 10 4B
1791:F4 60 00 00 AD 36 03 C9 68
1799:06 90 07 C9 15 B0 03 4C 2A
17A1:C1 16 4C D4 16 AD FE 03 75
17A9:D0 EA 4C D4 16 A9 30 8D 17
17B1:BA 17 A2 00 AD 1B D4 9D 78
17B9:00 50 E8 D0 F7 EE BA 17 2E
17C1:AD BA 17 C9 50 D0 EB A9 3C
17C9:30 8D EE 17 A9 00 8D ED 19
17D1:17 4C F2 17 AD ED 17 18 D9
17D9:69 01 8D ED 17 AD EE 17 F1
17E1:69 00 C9 4F D0 02 A9 30 05
17E9:8D EE 17 AD 47 30 60 00 14
17F1:00 A9 E1 8D 14 D4 A9 21 08
17F9:8D 12 D4 A9 0F 8D 18 D4 5C
1801:4C 2A 18 AE 36 03 BD 10 19
1809:18 8D 0F D4 4C E6 0B 00 EB
1811:80 7C 78 74 70 6E 6C 6A 77
1819:68 66 00 00 00 00 00 00 17
1821:00 00 00 00 00 00 00 00 51
1829:00 A9 00 8D 05 D4 4C 4C FC
1831:19 A9 00 8D 0F D4 4C 88 1E
1839:13 EE 0D D0 AD 0D D0 49 E9
1841:FF 8D 0F D4 60 00 00 A9 B0
1849:08 8D 09 D4 8D 0A D4 A9 37
1851:77 8D 06 D4 8D 0D D4 A9 A2
1859:41 8D 0B D4 A9 4C 8D 14 E9
1861:14 A9 00 8D 0F D4 4C 10 53
1869:19 AD FE 2F C9 01 D0 1B 73
1871:AE FF 2F BD 08 19 8D 08 82
1879:D4 A9 28 8D 01 D4 A9 81 8C
1881:8D 04 D4 A9 80 8D 04 D4 C5
1889:4C 05 19 C9 0F D0 28 A9 96
1891:40 8D 0B D4 A9 41 8D 0B 6C
1899:D4 A9 1E 8D 01 D4 EE FF 74
18A1:2F AE FF 2F BD 08 19 8D D5
18A9:08 D4 A9 81 8D 04 D4 A9 30
18B1:80 8D 04 D4 4C 05 19 C9 C5
18B9:10 D0 0F AE FF 2F BD 08 33
18C1:19 18 69 02 8D 08 D4 4C 54
18C9:05 19 C9 18 D0 23 A9 40 24
18D1:8D 0B D4 A9 41 8D 0B D4 EB
18D9:AE FF 2F BD 08 19 18 69 61
18E1:04 8D 08 D4 A9 81 8D 04 38
18E9:D4 A9 80 8D 04 D4 4C 05 E8
18F1:19 C9 1E D0 0F 20 21 19 46
18F9:AD FF 2F C9 08 D0 05 A9 BA
1901:00 8D FF 2F 4C 2C 19 04 D2
1909:08 0C 10 14 10 0C 08 78 BE
1911:A9 32 8D 14 03 A9 19 8D 16
1919:15 03 58 A9 00 4C 43 0C FF
1921:EE FF 2F A9 00 8D FE 2F AE
1929:60 00 00 EE FE 2F 4C 31 F8
1931:EA EE FD 2F AD FD 2F 29 34
1939:01 C9 01 F0 03 4C 31 EA 24
1941:4C 6A 18 20 D5 17 C9 B0 88
1949:B0 F9 60 8D FE 2F 8D FF 07
1951:2F 4C 65 19 AD 8D 02 D0 E4
1959:03 4C A7 15 A9 00 8D 0F DD
1961:D4 4C 55 19 A9 58 8D 18 2F
1969:03 A9 15 8D 19 03 A9 00 2B
1971:8D 10 D0 8D 1B D0 4C 48 5E
1979:18 AD C8 03 C9 0B 90 08 10
1981:AD 2D D0 49 08 8D 2D D0 26
1989:AD C8 03 60 A9 40 8D 15 A9
1991:D0 A9 A9 8D 0C D0 A9 9E 3A
1999:8D 0D D0 A9 26 8D FE 07 F6
19A1:AD 17 07 60 00 00 00 00 57
```

The Animals' Show

Article on page 56.

```
HB 70 SCNCLR:COLOR0,1:COLOR4,1
DP 80 GRAPHIC1,1:GRAPHIC0
JC 90 TEMPO57
QC 100 CHAR,2,2,"{6}TO SELECT:
       "
QH 110 CHAR,4,4,"JOYSTICK - PR
       ESS FIRE BUTTON"
KS 120 CHAR,4,6,"KEYPAD --- PR
       ESS 'ENTER' KEY"
BC 130 IFJOY(2)>127THENS$="300
        REM JOYSTICK":GOTO160
BX 140 GETE$:IFE$=CHR$(13)THEN
       S$="300 GOTO340:REM KEY
       PAD":GOTO160
BP 150 GOTO130
DA 160 PRINT"{CLR}{3 DOWN}"S$:
       PRINT"GOTO180{HOME}"
HJ 170 POKE208,2:POKE842,13:PO
       KE843,13:END
GG 180 SCNCLR
JP 190 SE=200:REM MAXIMUM SONG
        LENGTH
ES 200 DIM AN$(6),ZU$(30),V$(8
       ),SG(SE),AP(2,8),ST$(61
       2)
CH 210 GOSUB3560
SB 220 GOSUB3200
GH 230 GOSUB3360
DG 240 CHAR,14,22,"YOU'RE ON I
       N"
GX 250 CHAR,10,23,"15 SECONDS,
        MAESTRO!"
MP 260 GOSUB3480
KE 270 GOSUB490
MH 280 END
KH 290 REM INPUT DEVICE SUBROU
       TINE
JP 300 REM
PB 310 ID=JOY(2):IFID=0GOTO310
EG 320 IFID>128THENID=ID-128
DM 330 RETURN
BC 340 GETKEYNK$
MJ 350 ONVAL(NK$)GOTO390,400,4
       10,420,340,430,440,450,
       460
FE 360 IFNK$="0"THENID=0:GOTO4
       70
ME 370 IFNK$=CHR$(13)THENID=12
       8:GOTO470
RQ 380 GOTO340
KF 390 ID=6:GOTO470
HC 400 ID=5:GOTO470
CC 410 ID=4:GOTO470
BE 420 ID=7:GOTO470
BF 430 ID=3:GOTO470
CG 440 ID=8:GOTO470
HE 450 ID=1:GOTO470
JE 460 ID=2
RE 470 RETURN
MK 480 REM MENU ROUTINE
BA 490 SCNCLR:POKE2604,24
CF 500 GOSUB3140
PP 510 FORI=1TO5:SPRSAVZU$(I*6
       ),I:NEXT
FB 520 MOVSPR1,104,122:MOVSPR2
       ,120,82:MOVSPR3,172,74:
       MOVSPR4,224,82:MOVSPR5,
       240,122
MK 530 CHAR,17,10,"{8}()*)+,"
JR 540 CHAR,11,14,"{7}@@@-
       {DOWN}{4 LEFT}@./@
       {DOWN}{4 LEFT}@01@"
BP 550 CHAR,18,16,"{RED}6778
       {DOWN}{4 LEFT}9:;<
       {DOWN}{4 LEFT}=>>?"
PK 560 CHAR,25,14,"{YEL}WXYZ
       {DOWN}{4 LEFT}2345
       {DOWN}{4 LEFT}+{2 -}-"
DC 570 SPRCOLOR13,2
SE 580 FORI=1TO5:SPRITEI,1,16,
       ,,,1:NEXT
GP 590 CH=1
KH 600 FORID=1TO8
XD 610 GOSUB2980
QK 620 CH=ID
FJ 630 NEXT
DS 640 ID=1
XE 650 GOSUB2980
QQ 660 CH=ID
PK 670 GOSUB300
QQ 680 IFID>8GOTO720
XK 690 GOSUB2980
XS 700 CH=ID
GC 710 GOTO670
EK 720 FORI=1TO5:SPRITEI,0:NEX
       T
CJ 730 SCNCLR
FF 740 GOSUB3140
PP 750 ONCHGOTO1370,1370,1370,
       1100,770,810,1370,1370
PE 760 REM END PROGRAM
MG 770 POKE2604,20
```

```
CF 780 COLOR0,12:COLOR4,14:COL
       OR5,14
KK 790 RETURN
DM 800 REM DISK ROUTINE
KJ 810 POKE2604,20
BB 820 CHAR,1,1,"{7}DO YOU WIS
       H TO {CYN}{RVS}S{OFF}
       {7}AVE YOUR SONG
       {11 SPACES}{DOWN}OR
       {CYN}{RVS}L{OFF}{7}OAD
       {SPACE}AN OLD SONG?"
BF 830 GETKEYA$
SK 840 IFA$="S"THENCHAR,1,5,"
       {CYN}SAVE",1:GOTO870
SJ 850 IFA$="L"THENCHAR,1,5,"
       {CYN}LOAD",1:GOTO870
DR 860 GOTO830
GH 870 CHAR,1,7,"{7}WHAT IS TH
       E"
RS 880 CHAR,1,8,"SONG'S NAME"
HE 890 CHAR,14,9,"------------
       ----"
QR 900 CHAR,12,8,"{CYN}"
GJ 910 INPUTN$:N$="S"+N$
KJ 920 IFLEN(N$)>16THENN$=LEFT
       $(N$,16)
SG 930 IFA$="L"GOTO1020
HS 940 DOPEN#1,(N$),D0,U8,W
AF 950 GOSUB5440
BE 960 IFDS=63THENDCLOSE#1,U8:
       CHAR,1,1,"{YEL}THERE IS
        A SONG ON THIS DISK WI
       TH THAT{2 SPACES}{DOWN}
       NAME. PLEASE ENTER A DI
       FFERENT NAME.":GOTO870
XF 970 FORI=1TOSE
RQ 980 PRINT#1,SG(I)
MA 990 NEXT
GS 1000 DCLOSE#1,U8:GOSUB5440
GS 1010 GOTO490
SB 1020 DOPEN#1,(N$),D0,U8
DJ 1030 GOSUB5440
QK 1040 IFDS=62THENDCLOSE#1,U8
        :SCNCLR:CHAR,4,4,"{3}T
        HERE IS NO SONG WITH T
        HAT NAME":CHAR,13,6,"O
        N THIS DISK.":SLEEP6:G
        OTO490
FA 1050 FORI=1TOSE
XE 1060 INPUT#1,SG(I)
SF 1070 NEXT
EP 1080 DCLOSE#1,U8:GOSUB5440:
        SCNCLR
JC 1090 REM PLAY ROUTINE
SC 1100 POKE2604,24
JJ 1110 FORI=1TO5:SPRITEI,1:NE
        XT
EP 1120 CHAR,17,10,"{8}()*)+,"
AR 1130 CH=1:FORID=1TO8
XB 1140 IFID>3ANDID<7GOTO1160
DA 1150 GOSUB2980:CH=ID
HM 1160 NEXT
CP 1170 ID=1:GOSUB2980:CH=ID
QH 1180 GOSUB300:IFID>3ANDID<7
        GOTO1180
RJ 1190 IFID<>128THENGOSUB2980
        :CH=ID:GOTO1180
KE 1200 FORI=1TO5:SPRITEI,0:NE
        XT
SX 1210 SCNCLR
EM 1220 ONCHGOSUB1540,1620,169
        0,,,,1770,1840
BS 1230 GOSUB2010
JE 1240 GOSUB2710
BB 1250 SLEEP1
QC 1260 GOSUB2120
HX 1270 C=0
BX 1280 VOL15
CG 1290 DO WHILE SG(C)<128ANDC
        <SE
AK 1300 C=C+1
PD 1310 ID=SG(C)
AP 1320 GOSUB1910
SC 1330 LOOP
CR 1340 GOSUB2360
SE 1350 GOTO490
MX 1360 REM PERFORMANCE
RB 1370 ONCHGOSUB1540,1620,169
        0,,,,1770,1840
FJ 1380 GOSUB2010
DS 1390 GOSUB2710
CP 1400 GOSUB300:IFID<>128GOTO
        1400
PR 1410 GOSUB2120
MS 1420 GOSUB3140
SK 1430 C=0
GJ 1440 VOL15
MR 1450 DO
BG 1460 GOSUB300
ME 1470 GOSUB1910
DH 1480 C=C+1:IFC>SEGOTO1500
RG 1490 SG(C)=ID
RF 1500 LOOP UNTIL ID=128
GH 1510 GOSUB2360
GB 1520 GOTO490
SX 1530 REM CAT
FK 1540 S=13:SC=9:M1=10:M2=2:R
        S=1590
DH 1550 ENVELOPE 0,5,3,8,3,0
FD 1560 ENVELOPE 1,6,0,5,2,2,4
        000
DQ 1570 ENVELOPE 2,10,3,10,8,2
        ,450
XF 1580 RETURN
XH 1590 DATA "V1 O3 T0 C V2 T1
         C V3 T2 C","V1 O3 T0
        {SPACE}D V2 T1 D V3 T2
         D","V1 O3 T0 E V2 T1
        {SPACE}E V3 T2 E","V1
        {SPACE}O3 T0 F V2 T1 F
        V3 T2 F"
JR 1600 DATA "V1 O3 T0 G V2 T1
         G V3 T2 G","V1 O3 T0
        {SPACE}A V2 T1 A V3 T2
         A","V1 O3 T0 B V2 T1
        {SPACE}B V3 T2 B","V1
        {SPACE}O4 T0 C V2 T1 C
        V3 T2 C"
HQ 1610 REM MOUSE
KR 1620 S=19:SC=10:M1=9:M2=11:
        RS=1660
FR 1630 ENVELOPE 0,5,3,15,1,2,
        200
BS 1640 ENVELOPE 1,7,0,8,0,4
SK 1650 RETURN
GQ 1660 DATA "V1 O5 T0 C V2 T1
         C","V1 O5 T0 D V2 T1
        {SPACE}D","V1 O5 T0 E
        {SPACE}V2 T1 E","V1 O5
         T0 F V2 T1 F"
FE 1670 DATA "V1 O5 T0 G V2 T1
         G","V1 O5 T0 A V2 T1
        {SPACE}A","V1 O5 T0 B
        {SPACE}V2 T1 B","V1 O6
         T0 C V2 T1 C"
CE 1680 REM PARROT
BC 1690 S=25:SC=7:M1=8:M2=11:R
        S=1740
XB 1700 ENVELOPE 0,1,6,7,0,2,1
        600
HX 1710 ENVELOPE 1,3,2,5,2,4
GA 1720 ENVELOPE 2,15,6,15,9,2
        ,1400
CQ 1730 RETURN
GC 1740 DATA "V1 O5 T0 C V2 O1
         T1 C V3 O5 T2 C","V1
        {SPACE}O5 T0 D V2 O1 T
        1 D V3 O5 T2 D","V1 O5
         T0 E V2 O1 T1 E V3 O5
         T2 E","V1  O5 T0 F V2
        {SPACE}O1 T1 F V3 O5 T
        2 F"
QS 1750 DATA "V1 O5 T0 G V2 O1
         T1 G V3 O5 T2 G","V1
        {SPACE}O5 T0 A V2 O1 T
        1 A V3 O5 T2 A","V1 O5
         T0 B V2 O1 T1 B V3 O5
         T2 B","V1 O6 T0 C V2
        {SPACE}O2 T1 C V3 O6 T
        2 C"
AH 1760 REM FROG
BD 1770 S=1:SC=6:M1=14:M2=2:RS
        =1810
JM 1780 ENVELOPE 0,0,0,15,1,1
KB 1790 ENVELOPE 1,5,15,15,8,4
EA 1800 RETURN
BD 1810 DATA "V1 O1 T0 C V2 T1
         C","V1 O1 T0 D V2 T1
        {SPACE}D","V1 O1 T0 E
        {SPACE}V2 T1 E","V1 O1
         T0 F V2 T1 F"
FP 1820 DATA "V1 O1 T0 G V2 T1
         G","V1 O1 T0 A V2 T1
        {SPACE}A","V1 O1 T0 B
        {SPACE}V2 T1 B","V1 O2
         T0 C V2 T1 C"
QF 1830 REM PIG
FJ 1840 S=7:SC=11:M1=3:M2=13:R
        S=1880
QJ 1850 ENVELOPE 0,5,3,8,3,2,3
        75
KA 1860 ENVELOPE 1,10,0,5,0,2,
        3900
KH 1870 RETURN
MQ 1880 DATA "V1 O1 T0 C V2 T1
         C","V1 O1 T0 D V2 T1
        {SPACE}D","V1 O1 T0 E
        {SPACE}V2 T1 E","V1 O1
         T0 F V2 T1 F"
RE 1890 DATA "V1 O1 T0 G V2 T1
         G","V1 O1 T0 A V2 T1
        {SPACE}A","V1 O1 T0 B
        {SPACE}V2 T1 B","V1 O2
         T0 C V2 T1 C"
AF 1900 REM PLAY NOTE & MOVE A
        NIMAL
FG 1910 IFID=128THENRETURN
CG 1920 IFID=0THENFORI=1TO75:N
        EXT:RETURN
EP 1930 SPRSAVAN$(1),ID
SK 1940 PLAYV$(ID)
MK 1950 FORI=2TO6
PG 1960 FORJ=1TO30:NEXT
MC 1970 SPRSAVAN$(I),ID
CS 1980 NEXT
KX 1990 RETURN
EP 2000 REM READ SELECTED ANIM
        AL'S DATA
BQ 2010 C=0
SQ 2020 FORI=STOS+5
RG 2030 C=C+1
JR 2040 AN$(C)=ZU$(I)
RA 2050 NEXT
RD 2060 RESTORE RS
CC 2070 FORI=1TO8
QX 2080 READV$(I)
BE 2090 NEXT
MC 2100 RETURN
EA 2110 REM TURN ON SPRITES &
        {SPACE}OPEN CURTAIN
AG 2120 SPRCOLORM1,M2
FJ 2130 RESTORE2200
BG 2140 FORI=1TO8
BA 2150 READX,Y
XM 2160 SPRSAVAN$(6),I
EC 2170 MOVSPRI,X,Y
CP 2180 SPRITEI,1,SC,1,0,0,1
PM 2190 NEXT
XJ 2200 DATA172,88,212,96,252,
        120,212,144,172,152,13
        2,144,92,120,132,96
KQ 2210 FORI=19TO2STEP-1
HH 2220 FORJ=2TO18
SJ 2230 CHAR,I,J,ST$((I-2)*17+
        J-1)
FK 2240 CHAR,39-I,J,ST$((37-I)
        *17+J-1)
AK 2250 NEXTJ
AH 2260 GOSUB2640
```

```
DJ 2270 NEXTI
GM 2280 SOUND1,50000,180,2,350
        00,30,3
SR 2290 SOUND2,50000,180,2,250
        0,7000,3
GE 2300 FORI=5TO0STEP-1
HQ 2310 VOLI
FE 2320 FORJ=1TO250
GP 2330 NEXTJ,I
PC 2340 RETURN
HD 2350 REM CLOSE CURTAIN
MQ 2360 GOSUB2640
PK 2370 X=INT(RND(1)*6+1)*4
QP 2380 IFPEEK(1869+X)=64THENP
        C$="*P{DOWN}{2 LEFT}QR
        ":PO$="{RIGHT}{DOWN}S"
        :GOTO2400
FX 2390 PC$="TG{DOWN}{2 LEFT}U
        I":PO$="{DOWN}V"
CR 2400 COLOR5,15:CHAR,5+X,21,
        PC$
HS 2410 GOSUB2640
DB 2420 FORI=1TO5
PE 2430 CHAR,5+X,21,PO$
XD 2440 GOSUB2640
CX 2450 CHAR,5+X,21,PC$
QJ 2460 FORJ=1TO100
RF 2470 NEXTJ,I
KE 2480 IFPEEK(1869+X)=64THENC
        HAR,5+X,21,"*A{DOWN}
        {2 LEFT}BC":GOTO2500
BJ 2490 CHAR,5+X,21,"FG{DOWN}
        {2 LEFT}HI"
AE 2500 FORI=2TO18
XE 2510 FORJ=2TO17
BQ 2520 CHAR,I,J,"{RED}@J"
KG 2530 CHAR,38-I,J,"K@"
QP 2540 NEXTJ
GR 2550 CHAR,I,J,"FH"
BR 2560 CHAR,38-I,J,"IG"
CP 2570 GOSUB2640
DQ 2580 NEXTI
RJ 2590 FORI=1TO8:SPRITEI,0:NE
        XT
DM 2600 GOSUB2280
HF 2610 SLEEP1
AF 2620 RETURN
KB 2630 REM SOUND OF APPLAUSE
ES 2640 FILTER2000,1,0,0,0
JJ 2650 VOL5
BK 2660 SOUND1,50000,60,2,3500
        0,30,3
JX 2670 SOUND2,50000,60,2,2500
        ,7000,3
JC 2680 IFRND(1)>.85THENSOUND3
        ,55000,55,2,35000,2000
        ,2,2000
XP 2690 RETURN
DK 2700 REM DRAW STAGE & AUDIE
        NCE
GE 2710 FAST
GQ 2720 PRINT"{CLR}{RED}@@@@@@
        @@@@@@@@@@@@@@@@@@@@@@
        @@@@@@@@@@@@FFFFFFFFFF
        FFFFFFFFFFFFFFFFFFFFFF
        FFFFFFFF";
EB 2730 FORI=1TO16
KH 2740 PRINT"@@@@@@@@@@@@@@@@@
        @@@JK@@@@@@@@@@@@@@@@@
        @@";
RX 2750 NEXT
XJ 2760 PRINT"FFFFFFFFFFFFFFFF
        FFFHIGGGGGGGGGGGGGGGG
        GG"
XC 2770 PRINT"{8}CBA@Z[@@@Z[@@
        @Z[@@@Z[@@@Z[@@@Z[@@@Z
        [@ABC"
PX 2780 FORI=1TO8
CR 2790 IFRND(1)>.5THENP$="{7}
        .*A{DOWN}{2 LEFT}BC":GO
        TO2810
SQ 2800 P$="{7}FG{DOWN}
        {2 LEFT}HI"
BX 2810 CHAR,1+I*4,21,P$
RD 2820 NEXT
RF 2830 CHAR,3,22,"*A{DOWN}
        {2 LEFT}BEEE"
QR 2840 FORI=1TO7
XB 2850 IFRND(1)>.5THENP$="*A
        {DOWN}{2 LEFT}DEEE":GO
        TO2870
MA 2860 P$="FG{DOWN}{2 LEFT}JK
        EE"
RA 2870 CHAR,3+I*4,22,P$
DG 2880 NEXT
RC 2890 CHAR,35,22,"FG{DOWN}
        {2 LEFT}JI"
DR 2900 CHAR,2,24,"LEEO"
SB 2910 FORI=1TO7
HR 2920 CHAR,2+I*4,24,"NEEO"
SJ 2930 NEXT
CG 2940 CHAR,34,24,"NEEM"
EQ 2950 SLOW
PM 2960 RETURN
RF 2970 REM  POSITION ARROW
PG 2980 FORJ=0TO1
DE 2990 IFJ=0THENTP=CH:COLOR5,
        12
JR 3000 IFJ=1THENTP=ID:COLOR5,
        16
QM 3010 ONTPGOTO3030,3040,3050
        ,3060,3070,3080,3090,3
        100
PR 3020 GOTO3110
AP 3030 CHAR,19,7,"£]":GOTO31
        10
JB 3040 CHAR,22,8,"↑":GOTO3110
CM 3050 CHAR,24,10,"←":GOTO311
        0
FS 3060 CHAR,22,12,"↓":GOTO311
        0
KH 3070 CHAR,19,13,"#$":GOTO31
        10
RB 3080 CHAR,17,12,"%":GOTO311
        0
BH 3090 CHAR,15,10,"&":GOTO311
        0
DA 3100 CHAR,17,8,"'"
QQ 3110 NEXTJ
KC 3120 RETURN
MC 3130 REM CLEAR KEYBOARD BUF
        FER
MH 3140 FORI=842TO851
GC 3150 POKEI,0
RG 3160 NEXT
FM 3170 POKE208,0
XK 3180 RETURN
XS 3190 REM TITLE SCREEN
KM 3200 SCNCLR
FR 3210 RESTORE3310
GX 3220 COLOR5,11
BS 3230 FORY=1TO19
MB 3240 READX,A$
JR 3250 CHAR,X,Y,A$
HX 3260 NEXT
SG 3270 COLOR5,15
GD 3280 REM
PD 3290 REM
PX 3300 RETURN
FX 3310 DATA12,"{RVS}
        {9 SPACES}",12,"{RVS}
        {9 SPACES}",14,"{RVS}
        {5 SPACES}",14,"{RVS}
        {5 SPACES}{G} {RIGHT}
        {2 SPACES}{G} {2 @}"
AP 3320 DATA14,"{RVS}
        {5 SPACES}{G}
        {4 SPACES}{G}
        {2 SPACES}",14,"{RVS}
        {5 SPACES}{G} {RIGHT}
        {2 SPACES}{G} {2 T}",6
        ,"{RVS}£{*}",5,"{RVS}
        £{2 SPACES}{*}",4,"
        {RVS}£{4 SPACES}{*}",
        3,"{RVS}£{2 SPACES}
        {2 I}{2 SPACES}{*}
        {2 SPACES}{*}
        {2 SPACES}{G}
        {2 SPACES}{M}
        {2 SPACES}{*}£
        {2 SPACES}{RIGHT}£{*}
        {RIGHT}{2 SPACES}
        {2 RIGHT}£{2 SPACES}
        {*}{OFF}£{UP}{2 LEFT}
        {RVS}{G}"
FH 3330 DATA2,"{RVS}£
        {3 SPACES}{OFF}{2 I}
        {RVS}{3 SPACES}M
        {4 SPACES}{RIGHT}
        {2 SPACES}{RIGHT}
        {6 SPACES}£{D}{F}{*}
        {2 SPACES}{2 RIGHT}
        {OFF}{*}{RVS}{@}{T}{*}
        ",1,"{RVS}£{4 SPACES}
        {2 I}{4 SPACES}M{OFF}
        {*}{RVS}{2 SPACES}{G}
        {2 SPACES}{M}
        {2 SPACES}{OFF}{*}£
        {RVS}{2 SPACES}{G}{D}
        {F} M{2 SPACES}{M}
        {OFF}{*}{RVS}
        {2 SPACES}{OFF}£",0,"
        "
AS 3340 DATA9,"{RVS}£
        {5 SPACES}{*}",8,"
        {RVS}£{7 SPACES}{*}",
        8,"{OFF}{*}{RVS}
        {4 SPACES}{2 T}{*}",9,
        "{OFF}{*}{RVS}{2 @}
        {4 SPACES}M {RIGHT}
        {M}£{3 SPACES}{*}{G}
        {SPACE}£{*} {M}",8,"
        {OFF}{*}{RVS}
        {7 SPACES}N{3 SPACES}
        {M}{2 SPACES}{RIGHT}
        {2 SPACES}{G}
        {4 SPACES}{M}",9,"
        {OFF}{*}{RVS}
        {5 SPACES}{OFF}£{RVS}
        {G} {RIGHT} {M}{OFF}
        {*}{RVS}{3 SPACES}
        {OFF}£{RVS}{G} {OFF}
        £{*}{RVS} {M}{OFF}"
SM 3350 REM READ SPRITE DATA
JR 3360 RESTORE 3820
SQ 3370 FORI=0TO24STEP6
GJ 3380 FORJ=3584TO3967
RB 3390 READK
DE 3400 POKEJ,K
QB 3410 NEXTJ
FB 3420 FORJ=1TO6
HP 3430 SPRSAVJ,ZU$(I+J)
HD 3440 NEXTJ
PC 3450 NEXTI
GJ 3460 RETURN
RF 3470 REM READ CHARACTER DAT
        A
FP 3480 RESTORE4480
CE 3490 FORI=0TO93
MF 3500 FORJ=0TO7
BH 3510 READK
CM 3520 POKE8192+(I*8)+J,K
QK 3530 NEXTJ
AK 3540 NEXTI
KS 3550 RETURN
HM 3560 FAST
RA 3570 FORI=1TOSE:SG(I)=INT(R
        ND(1)*9):NEXT
FK 3580 RESTORE 3620
FX 3590 FORI=1TO2:FORJ=1TO8
AH 3600 READAP(I,J)
CP 3610 NEXTJ,I
BH 3620 DATA19,7,22,8,24,10,22
        ,12,19,13,17,12,15,10,
        17,8
XX 3630 RESTORE3700
BJ 3640 FORI=1TO612
HR 3650 READST$(I)
BB 3660 NEXTI
```

```
MP 3670 SLOW
XK 3680 RETURN
AB 3690 REM STAGE DATA
XQ 3700 DATA "{RED}J",J,J,J,J,
        J,J,J,J,J,J,J,J,J,J,J,
        H,"{BLU}J",J,J,J,J,J,J
        ,J,J,J,H,"{8}@",@,@,@,
        @,@,"{7}@",@,@,@,@,@,@
        ,F,"{8}@",@,@,@,@,@,@,
        @,@
FE 3710 DATA "{7}J",J,J,J,J,J,
        J,H,"{8}@",@,@,@,@,@,@
        ,@,@,"{CYN}@",@,@,@,@,
        D,"{8}@",@,@,@,@,@,@,@
        ,@,@,@,"{CYN}@",@,@,@,
        @,D,"{8}@",@,@,@,@,@,@
        ,@,@,@,@
XH 3720 DATA "{CYN}@",@,@,@,@,
        D,"{8}L",P,R,T,V,X,@,@
        ,@,@,@,"{CYN}@",@,@,@,
        @,D,"{8}M"," "," "," "
        ,@,@,@,@,@,@,@,"{CYN}@
        ",@,@,@,@,D,"{8}N"," "
        ," "," ",@,@,@,@,@,@,@
MJ 3730 DATA "{CYN}@",@,@,@,@,
        D,"{8}O",Q,S,U,W,Y,@,@
        ,@,@,@,"{CYN}@",@,@,@,
        @,D,"{8}@",@,@,@,@,@,@
        ,@,@,@,@,"{CYN}@",@,@,
        L,P,R,"{8}T",V,X,L,P,R
        ,T,V,X,@,@
DR 3740 DATA "{CYN}@",@,@,M,"
        {SPACE}"," ","{8} ",@,
        @,M," "," "," ",@,@,@,
        @,"{CYN}@",@,@,N," "," 
          ","{8} ",@,@,N," "," 
        {SPACE}"," ",@,@,@,@,"
        {CYN}@",@,@,O,Q,S,U,W,
        Y,O,Q,S,U,W,Y,@,@
CK 3750 DATA "{CYN}@",@,@,@,@,
        D,"{8}@",@,@,@,@,@,@,@
        ,@,@,@,"{CYN}@",@,L,P,
        R,T,"{8}V",X,@,@,L,P,R
        ,T,V,X,@,"{CYN}@",@,M,
        " "," "," "," ","{8}@",@,@
        ,@,M," "," "," ",@,@,@
FX 3760 DATA "{CYN}@",@,N," ",
        " "," "," ","{8}@",@,@,@,N
        ," "," "," ",@,@,@,"
        {CYN}@",@,O,Q,S,U,"{8}
        W",Y,@,@,O,Q,S,U,W,Y,@
        ,"{CYN}@",@,@,@,@,D,"
        {8}@",@,@,@,@,@,@,@,@,
        @,@
GG 3770 DATA "{CYN}@",@,@,L,P,
        R,"{8}T",V,X,L,P,R,T,V
        ,X,@,@,"{CYN}@",@,@,M,
        " "," "," ","{8} ",@,@,M,"
          "," "," ",@,@,@,@,@,"
        {CYN}@",@,@,N," "," ",
        "{8} ",@,@,N," "," ","
          ",@,@,@,@
PB 3780 DATA "{CYN}@",@,@,O,Q,
        S,"{8}U",W,Y,O,Q,S,U,W
        ,Y,@,@,"{CYN}@",@,@,@,
        @,D,"{8}@",@,@,@,@,@,@,@
        ,@,@,@,@,"{CYN}@",@,@,
        @,@,D,"{8}L",P,R,T,V,X
        ,@,@,@,@,@,@
XD 3790 DATA "{CYN}@",@,@,@,@,
        D,"{8}M"," "," "," ",@
        ,@,@,@,@,@,@,@,"{CYN}@",
        @,@,@,@,@,D,"{8}N"," ","
          "," ",@,@,@,@,@,@,@,@,"
        {CYN}@",@,@,@,@,D,"{8}
        O",Q,S,U,W,Y,@,@,@,@,@,@
QF 3800 DATA "{CYN}@",@,@,@,@,@,
        D,"{8}@",@,@,@,@,@,@,@
        ,@,@,@,"{CYN}@",@,@,@,
        @,D,"{8}@",@,@,@,@,@,@,@
        ,@,@,@,@,"{7}K",K,K,K,
        K,K,K,I,"{8}@",@,@,@,@,@
        ,@,@,@,@

AP 3810 DATA "{7}@",@,@,@,@,@,
        @,G,"{8}@",@,@,@,@,@,@
        ,@,@,"{BLU}K",K,K,K,K,
        K,K,K,K,K,I,"{8}@",@,@
        ,@,@,@,"{RED}K",K,K,K,
        K,K,K,K,K,K,K,K,K,K,K,
        K,I
BG 3820 REM FROG DATA
KS 3830 DATA 0,0,0,0,0,0,0,0,0,0
        ,2,130,128,11,235,224,
        11,40,224,42,170,168,1
        70,170,170,128,0,2,170
        ,170,170,42,170
GA 3840 DATA 168,10,170,160,26
        ,170,168,106,170,170,1
        70,170,170,166,170,170
        ,166,169,170, 41,166,1
        68,10,166,160,40,166,4
        0,162,130,138,0
SJ 3850 DATA 0,0,0,0,0,0,0,2,130
        ,128,11,235,224,11,40,
        224,43,235,232,170,170
        ,170,128,0,2,170,170,1
        70,42,170,168,10,170
HQ 3860 DATA 160,10,170,160,26
        ,170,168,106,170,170,1
        70,170,170,166,170,170
        ,166,169,170,41,166,16
        8,10,166,160,40,166,40
        ,162,130,138,0
BQ 3870 DATA 0,0,0,0,0,0,0,2,130
        ,128,11,40,224,11,235,
        224,43,235,232,170,170
        ,170,128,0,2,160,0,10,
        42,0,168,10,170
ED 3880 DATA 160,10,170,160,26
        ,170,168,106,170,170,1
        70,170,170,166,170,170
        ,166,169,170,41,166,16
        8,10,166,160,168,130,4
        2,0,130,0,0
AC 3890 DATA 0,0,0,0,0,0,0,2,130
        ,128,11,40,224,11,235,
        224,43,235,232,170,170
        ,170,160,0,10,160,0,10
        ,40,0,40,42,0
DS 3900 DATA 168,10,170,160,26
        ,170,168,106,170,170,1
        70,170,170,166,170,170
        ,166,169,170,41,166,16
        8,10,166,160,168,130,4
        2,0,130,0,0
JS 3910 DATA 0,0,0,0,0,0,0,0,0,0
        ,2,130,128,10,170,160,
        11,40,224,42,170,168,1
        70,170,170,128,0,2,168
        ,0,42,42,170
HR 3920 DATA 168,10,170,160,26
        ,170,168,106,170,170,1
        70,170,170,166,170,170
        ,166,169,170,41,166,16
        8,10,166,160,40,130,40
        ,130,0,130,0
DB 3930 DATA 0,0,0,0,0,0,0,0,0,0
        ,2,130,128,10,170,160,
        11,40,224,42,170,168,1
        70,170,170,128,0,2,170
        ,170,170,42,170
QP 3940 DATA 168,10,170,160,26
        ,170,168,106,170,170,1
        70,170,170,166,170,170
        ,166,169,170,41,166,16
        8,10,166,160,40,166,40
        ,162,130,138,0
ME 3950 REM PIG DATA
AD 3960 DATA 0,0,0,0,2,0,2,9,0
        ,9,164,0,2,170,0,6,168
        ,160,10,138,144,10,170
        ,96,6,170,160,1,170,12
        8,2,170
JP 3970 DATA 0,6,170,64,10,106
        ,144,10,154,160,1,154,
        168,137,186,168,42,250
        ,168,138,170,164,42,16
        6,160,2,154,144,0,188,
        92,0
CP 3980 DATA 0,0,0,0,2,0,2,9,0
        ,9,164,0,2,170,0,6,168
        ,160,10,138,144,10,170
        ,96,6,170,160,1,170,0,
        2,170
JH 3990 DATA 128,6,170,64,10,1
        06,144,10,154,160,1,15
        4,168,137,186,168,42,2
        50,168,138,170,164,42,
        166,160,2,154,144,0,18
        8,92,0
GJ 4000 DATA 0,0,0,0,0,0,42,10
        ,128,6,169,0,2,170,0,1
        0,136,128,10,170,160,1
        0,169,144,6,170,160,1,
        160,0,2,168
BP 4010 DATA 128,6,170,128,10,
        106,144,6,106,160,134,
        154,168,33,186,168,138
        ,250,168,138,170,164,4
        2,166,160,2,154,144,0,
        188,92,0
EF 4020 DATA 0,0,0,32,0,0,10,2
        ,128,6,169,32,2,170,0,
        10,136,128,10,170,160,
        10,169,144,6,138,160,1
        ,128,0,2,160
KD 4030 DATA 128,6,170,128,10,
        106,144,6,106,160,134,
        106,168,33,186,168,138
        ,250,168,138,170,164,4
        2,166,160,2,154,144,0,
        188,92,0
JC 4040 DATA 0,0,0,0,0,0,42,2,
        128,6,169,128,2,170,0,
        10,136,128,10,170,160,
        10,169,144,6,138,160,1
        ,160,0,2,168
KX 4050 DATA 128,6,170,128,10,
        106,144,6,106,160,1,15
        4,168,137,186,168,42,2
        50,168,138,170,164,42,
        166,160,2,154,144,0,18
        8,92,0
QM 4060 DATA 0,0,0,0,2,0,2,9,0
        ,9,164,0,2,170,0,6,168
        ,160,10,138,144,10,170
        ,96,6,162,160,1,168,0,
        2,170
HD 4070 DATA 128,6,170,64,10,1
        06,144,10,154,160,1,15
        4,168,137,186,168,42,2
        50,168,138,170,164,42,
        166,160,2,154,144,0,18
        8,92,0
SK 4080 REM CAT DATA
QF 4090 DATA 0,0,0,8,8,0,10,40
        ,0,10,168,0,11,184,0,8
        ,136,0,10,168,0,56,11,
        0,14,44,0,58,171,0,6,3
        6
FQ 4100 DATA 0,2,160,0,1,144,2
        ,2,168,9,10,170,8,10,1
        66,136,2,154,134,1,154
        ,129,1,154,161,1,134,1
        53,6,42,4,0
QH 4110 DATA 0,0,0,8,8,0,10,40
        ,0,10,168,0,8,136,0,11
        ,184,0,10,168,0,56,11,
        0,14,44,0,58,171,0,6,3
        6
EH 4120 DATA 0,2,32,32,1,144,3
        2,2,168,32,10,170,24,1
        0,166,132,2,154,134,1,
        154,129,1,154,161,1,13
        4,153,6,42,4,0
SJ 4130 DATA 0,0,0,8,8,0,10,40
        ,0,10,168,0,8,136,0,11
        ,184,0,10,168,0,200,8,
        192,62,47,0,202,168,19
        2,10,40
```

```
CP 4140 DATA 0,6,36,0,2,32,0,2
        ,168,0,10,170,0,10,166
        ,168,2,154,134,1,154,1
        29,1,154,161,1,134,153
        ,6,42,4,0
AK 4150 DATA 0,0,0,8,8,0,10,40
        ,0,10,168,0,8,136,0,11
        ,184,0,10,168,0,200,8,
        192,62,47,0,202,168,19
        2,10,40
SS 4160 DATA 0,6,36,0,2,32,0,2
        ,168,0,10,170,0,10,166
        ,128,2,154,152,1,154,1
        49,1,154,161,1,134,153
        ,6,42,4,0
AK 4170 DATA 0,0,0,8,8,0,10,40
        ,0,10,168,0,11,184,0,8
        ,136,0,10,168,0,56,11,
        0,14,44,0,58,171,0,6,3
        6
EG 4180 DATA 0,2,32,0,1,144,12
        8,2,168,104,10,170,6,1
        0,166,129,2,154,129,1,
        154,137,1,154,164,1,13
        4,144,6,42,0,0
FB 4190 DATA 0,0,0,8,8,0,10,40
        ,0,10,168,0,11,184,0,8
        ,136,0,10,168,0,56,11,
        0,14,44,0,58,171,0,6,1
        00
MX 4200 DATA 2,2,160,9,1,144,8
        ,2,168,8,10,170,6,10,1
        66,129,2,154,130,1,154
        ,137,1,154,164,1,134,1
        44,6,42,0,0
MQ 4210 REM MOUSE DATA
KF 4220 DATA 0,0,0,0,0,0,0,0,0,0
        ,0,0,0,0,0,0,0,0,0,0,0,0
        ,0,0,130,0,0,171,0,1,1
        38,0,3,250
PB 4230 DATA 0,3,250,128,0,58,
        128,0,234,160,0,171,16
        0,3,174,160,0,170,144,
        3,171,140,3,3,12,0,0,4
        8,0,15,192,0
SF 4240 DATA 0,0,0,0,0,0,0,0,0,0
        ,0,0,0,0,0,0,0,0,0,0,1
        30,0,0,171,0,1,138,0,3
        ,250,0,3,250
DD 4250 DATA 0,0,58,128,0,58,1
        28,0,250,160,0,171,160
        ,3,174,160,0,170,144,3
        ,171,140,3,3,3,0,0,12,
        0,3,240,0
PJ 4260 DATA 0,0,0,0,0,0,0,0,0,0
        ,0,0,0,0,130,0,0,171,0
        ,1,138,0,3,250,0,3,250
        ,0,0,58,0,0,58
RS 4270 DATA 0,0,58,128,0,250,
        128,0,170,160,13,170,1
        76,2,170,160,0,170,144
        ,3,170,204,3,0,195,0,0
        ,3,0,0,252,0
QP 4280 DATA 0,0,0,0,0,0,0,0,130
        ,0,0,131,0,0,171,0,1,1
        38,0,3,250,0,3,254,0,0
        ,46,0,0,14,0,0,14
QE 4290 DATA 0,0,46,0,0,250,12
        8,0,170,172,13,170,160
        ,2,170,160,0,170,144,3
        ,170,204,3,0,195,0,0,1
        2,0,3,240,0
KR 4300 DATA 0,0,0,0,0,0,0,0,0,0
        ,0,0,0,0,0,0,0,0,130,0,0
        ,171,0,1,138,0,3,250,0
        ,3,250,0,0,58
DX 4310 DATA 0,0,58,128,0,250,
        128,0,170,160,3,170,17
        6,0,170,224,0,170,144,
        3,171,140,3,3,3,0,0,12
        ,0,3,240,0
XD 4320 DATA 0,0,0,0,0,0,0,0,0,0
        ,0,0,0,0,0,0,0,0,0,0,0,0
        ,0,0,130,0,0,171,0,1,1
        38,0,3,250
QB 4330 DATA 0,3,250,128,0,234
        ,128,0,171,160,3,174,1
        60,0,170,160,0,170,144
        ,3,175,140,3,12,12,0,0
        ,48,0,15,192,0
QS 4340 REM PARROT DATA
MJ 4350 DATA 0,0,0,0,0,0,0,0,0,0
        ,0,0,0,0,0,40,0,15,150,0
        ,63,134,128,255,134,12
        8,207,150,128,3,170,0,
        0,40
QP 4360 DATA 0,0,8,0,0,40,0,1,
        169,0,6,165,64,6,165,6
        4,2,169,64,1,170,64,0,
        42,128,3,207,160,3,12,
        40,0
PB 4370 DATA 0,0,0,0,0,0,0,0,0,0
        ,60,40,0,255,134,0,255
        ,134,128,195,150,128,1
        5,150,128,3,170,0,0,40
        ,0,0,8
FK 4380 DATA 0,0,40,0,1,170,64
        ,6,169,64,6,169,64,2,1
        69,64,1,170,64,0,42,12
        8,0,251,160,3,207,160,
        3,12,40,0
MM 4390 DATA 0,0,0,0,0,0,0,63,40
        ,0,255,134,0,195,134,1
        28,3,150,128,3,150,128
        ,15,170,0,0,40,0,0,8,0
        ,0,40
FR 4400 DATA 0,5,170,64,6,170,
        80,6,170,80,6,170,64,1
        ,170,64,0,42,128,0,59,
        160,0,243,160,3,207,40
        ,3,12,0,0
GC 4410 DATA 60,0,0,255,40,0,2
        07,134,0,3,134,128,3,1
        34,128,3,150,128,15,17
        0,0,0,42,0,0,8,0,0,8,0
        ,4,40
EM 4420 DATA 16,21,170,84,22,1
        70,148,22,170,148,6,17
        0,144,4,170,16,0,42,12
        8,0,59,160,0,243,160,3
        ,207,40,3,12,0,0
MF 4430 DATA 0,0,0,0,0,0,0,0,0,0
        ,0,40,0,15,150,0,63,13
        4,128,255,134,128,195,
        150,128,15,170,0,0,40,
        0,0,8
MG 4440 DATA 0,0,8,0,4,40,64,2
        1,169,80,22,169,80,22,
        169,80,22,170,80,4,170
        ,16,0,42,128,3,207,160
        ,3,12,40,0
BH 4450 DATA 0,0,0,0,0,0,0,0,0,0
        ,0,0,0,0,0,40,0,15,150,0
        ,63,134,128,255,134,12
        8,207,150,128,3,170,0,
        0,40
PQ 4460 DATA 0,0,8,0,4,40,64,2
        1,169,80,22,169,80,22,
        169,80,6,170,80,1,170,
        64,0,42,128,3,207,160,
        3,12,40,0
MF 4470 REM CHARACTER DATA
GA 4480 DATA 255,255,255,255,2
        55,255,255,255
EP 4490 DATA 255,255,255,255,2
        55,255,0,0
RX 4500 DATA 255,255,255,255,0
        ,0,0,0
CJ 4510 DATA 255,255,0,0,0,0,0
        ,0
RE 4520 DATA 255,255,255,255,2
        55,255,85,170
DH 4530 DATA 255,0,170,85,170,
        85,170,85
CQ 4540 DATA 255,255,231,102,1
        02,24,24,0
RR 4550 DATA 255,255,231,102,1
        02,24,24,0
RP 4560 DATA 254,254,230,102,1
        02,24,24,0
SM 4570 DATA 127,127,103,102,1
        02,24,24,0
ES 4580 DATA 254,254,254,254,2
        54,254,254,254
SB 4590 DATA 127,127,127,127,1
        27,127,127,127
JH 4600 DATA 255,252,240,224,1
        92,192,128,128
GE 4610 DATA 255,31,4,0,0,0,0,
        0
XM 4620 DATA 255,248,32,0,0,0,
        0,0
FK 4630 DATA 255,63,15,7,3,3,1
        ,1
SA 4640 DATA 128,128,128,128,1
        28,128,128,128
AF 4650 DATA 1,1,1,1,1,1,1,1
JB 4660 DATA 128,192,192,192,1
        92,224,224,224
CF 4670 DATA 1,3,3,3,3,7,7,7
DC 4680 DATA 192,128,0,32,24,1
        66,144,157
KD 4690 DATA 3,1,0,4,24,101,9,
        185
KC 4700 DATA 156,156,156,156,1
        56,156,156,156
GF 4710 DATA 57,57,57,57,57,57
        ,57,57
AR 4720 DATA 157,159,159,159,1
        59,191,255,255
QR 4730 DATA 185,249,249,249,2
        49,253,255,255
FK 4740 DATA 255,248,224,192,1
        92,192,128,128
FK 4750 DATA 255,31,7,3,3,3,1,
        1
SR 4760 DATA 1,3,7,13,1,1,1,1
BK 4770 DATA 128,192,224,176,1
        28,128,128,128
GJ 4780 DATA 63,31,15,31,59,11
        2,224,64
PG 4790 DATA 8,12,6,255,255,6,
        12,8
FG 4800 DATA 0,0,0,0,0,0,0,0
HE 4810 DATA 64,224,112,59,31,
        15,31,63
PH 4820 DATA 0,0,0,0,0,0,0,0
HF 4830 DATA 1,1,1,1,13,7,3,1
MR 4840 DATA 128,128,128,128,1
        76,224,192,128
CP 4850 DATA 2,7,14,220,248,24
        0,248,252
XG 4860 DATA 16,48,96,255,255,
        96,48,16
DS 4870 DATA 252,248,240,248,2
        20,14,7,2
QQ 4880 DATA 0,126,96,126,6,6,
        126,0
FQ 4890 DATA 0,126,96,120,96,9
        6,126,0
BQ 4900 DATA 0,96,96,96,96,96,
        126,0
HX 4910 DATA 0,126,96,96,96,96
        ,126,0
QQ 4920 DATA 0,126,24,24,24,24
        ,24,0
XF 4930 DATA 255,255,255,255,2
        55,240,240,240
GX 4940 DATA 252,243,228,232,2
        32,228,243,252
PX 4950 DATA 63,207,39,23,23,3
        9,207,63
RK 4960 DATA 255,254,252,252,2
        52,252,254,255
HB 4970 DATA 255,127,63,63,63,
        63,127,255
AD 4980 DATA 192,192,207,205,2
        07,204,204,224
XF 4990 DATA 219,0,48,176,48,4
        8,62,0
```

```
FQ 5000 DATA 224,0,51,121,204,
        252,204,0
RB 5010 DATA 3,3,51,227,195,19
        5,195,7
KS 5020 DATA 1,3,6,13,27,55,11
        1,223
AM 5030 DATA 255,0,255,255,255
        ,255,255,255
GA 5040 DATA 128,192,96,176,21
        6,236,246,251
JF 5050 DATA 184,176,179,176,1
        84,190,176,176
HR 5060 DATA 64,64,243,243,115
        ,115,115,243
PF 5070 DATA 206,134,134,50,50
        ,134,134,206
KJ 5080 DATA 29,13,77,77,13,29
        ,125,125
SB 5090 DATA 223,111,55,27,13,
        6,3,1
AE 5100 DATA 255,255,255,255,2
        55,255,0,255
RC 5110 DATA 251,246,236,216,1
        76,96,192,128
GK 5120 DATA 7,15,31,31,63,63,
        63,63
FQ 5130 DATA 224,240,248,248,2
        52,252,252,252
CE 5140 DATA 63,31,31,15,15,15
        ,31,127
BD 5150 DATA 252,248,248,240,2
        40,240,248,254
KM 5160 DATA 63,31,159,79,175,
        79,31,127
GA 5170 DATA 252,249,250,241,2
        42,241,248,254
SG 5180 DATA 0,0,7,15,31,31,63
        ,63
GX 5190 DATA 0,0,224,240,248,2
        48,252,252
DX 5200 DATA 63,63,63,63,255,1
        27,15,63
GK 5210 DATA 252,252,252,252,2
        55,254,240,252
AM 5220 DATA 63,63,191,63,255,
        127,15,63
KQ 5230 DATA 252,253,252,252,2
        55,254,240,252
HC 5240 DATA 0,0,10,21,42,85,4
        2,85
SS 5250 DATA 0,0,168,84,170,84
        ,170,84
BG 5260 DATA 170,64,138,21,42,
        85,42,85
RG 5270 DATA 170,1,168,84,170,
        84,170,84
XA 5280 DATA 224,248,252,248,2
        00,248,236,254
FH 5290 DATA 63,63,31,31,15,7,
        31,127
KF 5300 DATA 248,248,248,248,1
        92,224,248,254
DG 5310 DATA 248,248,224,248,2
        48,224,248,254
CF 5320 DATA 0,0,3,15,31,63,63
        ,31
CE 5330 DATA 19,51,63,31,31,31
        ,7,63
XP 5340 DATA 19,51,63,31,7,31,
        7,63
XS 5350 DATA 3,31,62,112,96,96
        ,224,192
RG 5360 DATA 255,255,0,0,243,2
        19,243,219
RJ 5370 DATA 255,255,0,0,224,0
        ,207,0
AP 5380 DATA 192,248,124,14,6,
        6,7,3
KQ 5390 DATA 96,96,112,62,31,3
        ,0,0
XA 5400 DATA 0,0,0,0,255,255,0
        ,0
FM 5410 DATA 6,0,48,60,255,255
        ,60,48
MH 5420 REM READ ERROR CHANNEL
KC 5430 END
EB 5440 IFDS=620RDS=63THENPRIN
        T"{BLK}"DS$:RETURN
KD 5450 IFDS=0THENRETURN
DJ 5460 PRINTDS$:STOP
```

128 Quicksort

See instructions in article on page 86 before typing in.

Program 1: Quicksort 128

```
1300:4C 23 13 00 00 00 00 00 77
1308:00 00 00 00 00 00 00 00 2E
1310:00 00 00 00 00 00 00 00 36
1318:00 00 00 00 00 00 00 00 3E
1320:00 00 00 20 5C 79 20 D7 29
1328:77 20 15 88 A5 16 8D 18 F5
1330:13 A5 17 8D 19 13 20 5C B6
1338:79 20 EF 77 A5 49 8D 03 09
1340:13 A5 4A 8D 04 13 20 0B 33
1348:17 20 A8 17 A5 FA F0 01 84
1350:60 A2 01 8E 10 13 8E 0C 4E
1358:13 CA 8E 11 13 8E 0D 13 9D
1360:20 F8 15 AD 18 13 8D 1E 98
1368:13 AD 19 13 8D 1F 13 20 07
1370:14 16 20 C3 15 20 D9 15 58
1378:38 AD 10 13 E9 01 8D 10 D7
1380:13 AD 11 13 E9 00 8D 11 6A
1388:13 AD 20 13 8D 0C 13 AD 49
1390:21 13 8D 0D 13 AD 1E 13 2D
1398:8D 0A 13 AD 1F 13 8D 0B B0
13A0:13 18 AD 20 13 6D 1E 13 AB
13A8:85 FA AD 21 13 6D 1F 13 B7
13B0:4A 85 FB 66 FA 20 76 17 9F
13B8:AD 0C 13 85 FA AD 0D 13 2F
13C0:85 FB 20 AD 16 AD 22 13 46
13C8:C9 02 D0 06 20 88 14 4C 66
13D0:B8 13 AD 0A 13 85 FA AD C0
13D8:0B 13 85 FB 20 AD 16 AD 4B
13E0:22 13 C9 01 D0 06 20 9A 9F
13E8:14 4C D2 13 AD 0C 13 8D 09
13F0:12 13 AD 0D 13 8D 13 13 73
13F8:AD 0A 13 8D 14 13 AD 0B 07
1400:13 8D 15 13 20 89 16 AD E9
1408:22 13 C9 01 F0 0C 20 04 4B
1410:15 20 88 14 20 9A 14 4C FC
1418:B8 13 AD 1E 13 8D 14 13 03
1420:AD 1F 13 8D 15 13 20 89 E0
1428:16 AD 22 13 C9 02 D0 17 4B
1430:18 AD 10 13 69 01 8D 10 7D
1438:13 AD 11 13 69 00 8D 11 20
1440:13 20 F8 15 20 14 16 AD 95
1448:0A 13 8D 1E 13 AD 0B 13 46
1450:8D 1F 13 AD 20 13 8D 12 BE
1458:13 AD 21 13 8D 13 13 AD 57
1460:1E 13 8D 14 13 AD 1F 13 EF
1468:8D 15 13 20 89 16 AD 22 23
1470:13 C9 02 D0 03 4C 89 13 51
1478:AD 10 13 D0 05 AD 11 13 FE
1480:F0 03 4C 72 13 85 FA 60 97
1488:18 AD 0C 13 69 01 8D 0C 51
1490:13 AD 0D 13 69 00 8D 0D F3
1498:13 60 38 AD 0A 13 E9 01 B5
14A0:8D 0A 13 AD 0B 13 E9 00 C7
14A8:8D 0B 13 60 20 D0 14 A9 D8
14B0:47 A2 01 A0 00 20 74 FF B8
14B8:8D 09 13 A9 47 A2 01 C8 76
14C0:20 74 FF 85 FE A9 47 A2 3E
14C8:01 C8 20 74 FF 85 FF 60 65
14D0:A5 FA 0A 85 47 A5 FB 2A 17
14D8:85 48 18 A5 47 65 FA 85 7E
14E0:47 A5 48 65 FB 85 48 18 14
14E8:A5 47 6D 03 13 85 47 A5 76
14F0:48 6D 04 13 85 48 38 A5 AD
14F8:47 E9 03 85 47 A5 48 E9 43
1500:00 85 48 60 AD 0A 13 85 DB
1508:FA AD 0B 13 85 FB 20 AC B6
1510:14 A5 47 8D 05 13 A5 48 77
1518:8D 06 13 AD 09 13 8D 07 7E
1520:13 A5 FE 8D 0E 13 A5 FF FD
1528:8D 0F 13 AD 0C 13 85 FA CC
1530:AD 0D 13 85 FB 20 AC 14 FC
1538:AD 05 13 85 FA AD 06 13 E2
1540:85 FB A9 FA 8D B9 02 AD 16
1548:09 13 A2 01 A0 00 20 77 DC
1550:FF A5 FE A2 01 C8 20 77 D0
1558:FF A5 FF A2 01 C8 20 77 F8
1560:FF A9 47 8D B9 02 AD 07 EE
1568:13 A2 01 A0 00 20 77 FF 5E
1570:AD 0E 13 A2 01 C8 20 77 64
1578:FF AD 0F 13 A2 01 C8 20 EB
1580:77 FF 60 20 97 15 20 97 5D
1588:15 38 A5 FA E9 02 85 FA 0D
1590:A5 FB E9 00 85 FB 60 18 BE
1598:A5 FA 6D 10 13 85 FA A5 4D
15A0:FB 6D 11 13 85 FB 60 AD 02
15A8:1A 13 85 FA AD 1B 13 85 8A
15B0:FB 20 83 15 EA EA EA 60 DB
15B8:AD 1C 13 85 FA AD 1D 13 57
15C0:4C AF 15 20 A7 15 A9 FA 81
15C8:A2 01 A0 00 20 74 FF 8D F8
15D0:20 13 20 EF 15 8D 21 13 07
15D8:60 20 B8 15 A9 FA A2 01 23
15E0:A0 00 20 74 FF 8D 1E 13 2C
15E8:20 EF 15 8D 1F 13 60 A9 4A
15F0:FA A2 01 C8 20 74 FF 60 21
15F8:20 A7 15 A9 FA 8D B9 02 DD
1600:AD 0C 13 A2 01 A0 00 20 3D
1608:77 FF AD 0D 13 A2 01 C8 64
1610:20 77 FF 60 20 B8 15 A9 E7
1618:FA 8D B9 02 AD 1E 13 A2 2B
1620:01 A0 00 20 77 FF AD 1F 2D
1628:13 A2 01 C8 20 77 FF 60 72
1630:AD 16 13 CD 17 13 D0 06 A4
1638:A9 00 8D 22 13 60 8A 48 84
1640:A5 47 48 A9 80 85 47 A2 FF
1648:08 A9 00 8D 07 13 8D 08 63
1650:13 A5 47 2D 16 13 F0 03 0D
1658:EE 07 13 A5 47 2D 17 13 AA
1660:F0 03 EE 08 13 AD 07 13 94
1668:38 ED 08 13 F0 07 10 0E 30
1670:A9 02 4C 80 16 46 47 CA A6
1678:D0 CF 8A 4C 80 16 A9 01 C7
1680:8D 22 13 68 85 47 68 AA A9
1688:60 AD 13 13 8D 16 13 AD 7C
1690:15 13 8D 17 13 20 30 16 BE
1698:AD 22 13 D0 0F AD 12 13 F9
16A0:8D 16 13 AD 14 13 8D 17 75
16A8:13 20 30 16 60 20 AC 14 BE
16B0:A5 FE 85 FC A5 FF 85 FD 26
16B8:AD 09 13 8D 05 13 F0 3F CE
16C0:20 5C 17 AD 09 13 F0 3D 85
16C8:A0 00 A9 FC A2 01 20 74 18
16D0:FF 8D 16 13 A9 FE A2 01 E3
16D8:20 74 FF 8D 17 13 20 30 80
16E0:16 AD 22 13 F0 01 60 CE 14
16E8:05 13 F0 08 CE 09 13 F0 AC
16F0:14 C8 D0 D6 CE 09 13 D0 72
16F8:06 A9 00 8D 22 13 60 A9 33
1700:02 8D 22 13 60 A9 01 8D 41
1708:22 13 60 18 A5 33 69 01 67
1710:8D 1A 13 A5 34 69 00 8D 1D
1718:1B 13 38 A5 35 ED 1A 13 A2
1720:85 FA A5 36 ED 1B 13 4A 34
1728:85 FB 66 FA 18 AD 1A 13 53
1730:65 FA 8D 1C 13 AD 1B 13 DB
1738:65 FB 8D 1D 13 38 AD 1C 8C
1740:13 E9 26 8D 1C 13 AD 1D B5
1748:13 E9 00 8D 1D 13 38 A5 9E
1750:35 E9 51 85 49 A5 36 E9 4D
1758:00 85 4A 60 A9 49 A2 01 EF
1760:A0 00 20 74 FF 8D 09 13 85
1768:18 A5 49 69 01 85 FE A5 8D
1770:4A 69 00 85 FF 60 20 AC E4
1778:14 A9 49 8D B9 02 AD 09 57
1780:13 A2 01 A0 00 20 77 FF 7A
1788:AD 09 13 D0 01 60 A0 00 0A
1790:A9 FE A2 01 20 74 FF A2 2D
1798:49 8E B9 02 A2 01 C8 20 31
17A0:77 FF CE 09 13 D0 E9 60 05
17A8:38 A5 35 E5 33 8D 12 13 68
```

```
17B0:A5 36 E5 34 8D 13 13 A9 C7
17B8:FF 8D 14 13 A9 00 8D 15 7B
17C0:13 20 89 16 A9 00 85 FA 66
17C8:AD 22 13 C9 01 F0 02 E6 0C
17D0:FA 60 00 00 00 00 00 00 94
```

Program 2: Quicksort Demo

```
HD 10 BLOAD"SORT128.OBJ",P4864
KM 20 PRINT"{CLR}{DOWN}{WHT}HO
      W MANY RANDOM STRINGS TO
       CREATE":INPUT N
BQ 30 DIM A$(N):PRINT"{CLR}
      {DOWN}CREATING"N"RANDOM
      {SPACE}STRINGS":SD=-TI:A
      =RND(SD)
FC 40 FORI=1TON:PRINTI;CHR$(14
      5):N1=INT(RND(1)*10+1):A
      $="":FORJ=1TON1
EG 50 B$=CHR$(INT(RND(1)*26+65
      )):A$=A$+B$:NEXT:A$(I)=A
      $:NEXT
RA 60 PRINT"{2 DOWN}PRESS ANY
      {SPACE}KEY TO START SORT
      ":GETKEY A$
FX 70 FAST:T1=TI:SYS4864,,,,,N
      ,A$(1):T2=TI:PRINT"{CLR}
      {DOWN}DONE{2 DOWN}":SLOW
JK 80 IFPEEK(250)<>0THENPRINT"
      NOT ENOUGH MEMORY TO SOR
      T":END
BP 90 MT$=STR$((T2-T1)/60):PRI
      NT N"ELEMENTS SORTED IN"
      LEFT$(MT$,6)" SECONDS"
DF 100 PRINT"{2 DOWN}PRESS ANY
       KEY FOR SORTED LIST
       {DOWN}":GETKEY A$:FORI=
       1TON:PRINTA$(I):NEXT
```

Bar Charter

Article on page 82.

```
PA 100 N=38:DIMB(N):FORI=1TON:
       READT:B=B+T:B(I)=B:NEXT
       :REM SET N TO # OF INCR
       EMENTS
AD 110 INPUT"{CLR}ACCOUNT NAME
       ";AN$:AN$=LEFT$(AN$,39)
       :PRINT
XQ 120 DATA50,20,-15,25,30,12,
       -20,17
XS 130 DATA5,10,13,-9,22,11,10
       ,-17
XQ 140 DATA10,15,12,-30,-25,-1
       0,30,10
FR 150 DATA-10,-25,-16,-27,10,
       15,-16,10
QH 160 DATA-15,-16,-12,-20,-10
       ,12
GP 1000 REM{2 SPACES}BEGIN CHA
        RT ROUTINE
HX 1010 POKE53280,0:POKE53281,
        0:PRINT"{4}"
FR 1020 L5$="5{38 T}"
KB 1030 L0$="0{38 T}"
XB 1040 INPUT"SET INCREMENT VA
        LUE";INC:PRINT"{CLR}"
SS 1050 INC$=STR$(INC):IFLEN(I
        NC$)>5THEN1340
CD 1060 IFINC<1THEN1340
PX 1070 PRINT"RELATIVE BALANCE
        S. INCREMENTS = $"IN
HE 1080 FORI=1TO39:PRINT"{RVS}
         ";:NEXT:PRINT:PRINT"
        {UP}{OFF}"
XX 1090 FORI=1TO4:PRINT"{T}":N
        EXT
MH 1100 PRINTL5$:FORI=1TO4:PRI
        NT"{T}":NEXT
AF 1110 PRINTL0$:FORI=1TO4:PRI
        NT"{T}":NEXT
EB 1120 PRINTL5$:FORI=1TO4:PRI
        NT"{T}":NEXT
BA 1130 VL=22:X=1:A=0
HX 1140 A=A+1:IFA>NTHEN1290
XJ 1150 COL=COL+1:IFCOL>15THEN
        COL=1
PP 1160 POKE646,COL
HA 1170 BL=B(A)/INC
CB 1180 IFINC>B(A)THENEM=1:GOT
        O1260
MX 1190 IFBL=>20THENEM=2:GOTO1
        260
HG 1200 DV=VL-INT(BL)
EF 1210 POKE782,X:POKE781,DV:S
        YS65520
SH 1220 PRINT"{K}"
RK 1230 IFBL<2THEN1250
AP 1240 FORI=1TOBL-1:PRINTTAB(
        X)"{K}":NEXT
SX 1250 X=X+1:GOTO1140
RJ 1260 POKE782,X:POKE781,21:S
        YS65520
MX 1270 IFEM=1THENPRINT"<":GOT
        O1250
SK 1280 PRINT">":GOTO1250
EP 1290 POKE782,0:POKE781,22:S
        YS65520
BG 1300 PRINT"{4}{RVS}
        {2 SPACES}<-BELOW SCAL
        E{3 SPACES}:{3 SPACES}
        >-EXCEEDS RANGE
        {2 SPACES}{OFF}"
QE 1310 PRINT"ANY KEY TO EXIT.
        .."
XP 1320 GETOP$:IFOP$=""THEN132
        0
BR 1330 END:REM [END CHART ROU
        TINE - BRANCH BACK TO
        {SPACE}MAIN PROGRAM]
EF 1340 PRINT"{DOWN}UNACCEPTAB
        LE VALUE - OUT OF RANG
        E{DOWN}":GOTO1040
```

Fast Hi-Res Screen Dump

Article on page 70.

```
GP 10 INPUT"{CLR}{2 DOWN}{WHT}
      WHAT IS THE STARTING ADD
      RESS";L:LL=L
CD 20 READ A:IFA<0 THEN40
EQ 30 CKSUM=CKSUM+A:POKE LL,A:
      LL=LL+1:GOTO20
ME 40 IF CKSUM<> 33095 THEN PR
      INT "{CLR}{2 DOWN}ERROR
      {SPACE}IN DATA STATEMENT
      S":END
QJ 50 PRINT"{CLR}{2 DOWN}HIRES
       DUMP INSTALLED":PRINT"
      {2 DOWN}SYS"L"TO ACTIVAT
      E"
PM 60 DATA 169,0,32,189,255,16
      9,4,170
FQ 70 DATA 160,4,32,186,255,32
      ,192,255,162
GC 80 DATA 4,32,201,255,169,27
      ,32,210
JJ 90 DATA 255,169,64,32,210,2
      55,169,27
SJ 100 DATA 32,210,255,169,65,
       32,210,255
GS 110 DATA 169,8,32,210,255,1
       62,39,134
AC 120 DATA 250,169,27,32,210,
       255,169,75
XJ 130 DATA 32,210,255,169,200
       ,32,210,255
DS 140 DATA 169,0,32,210,255,1
       62,0,134
ED 150 DATA 251,162,0,134,252,
       166,251,134
EK 160 DATA 195,162,0,134,196,
       162,6,24
SS 170 DATA 6,195,38,196,202,2
       08,249,162
BB 180 DATA 0,134,253,134,254,
       162,5,24
AB 190 DATA 165,253,101,195,13
       3,253,165,254
SH 200 DATA 101,196,133,254,20
       2,208,240,134
SX 210 DATA 196,166,250,134,19
       5,162,3,24
SC 220 DATA 6,195,38,196,202,2
       08,249,240
CD 230 DATA 4,16,164,208,186,2
       4,165,195
EH 240 DATA 101,252,133,195,16
       5,196,105,32
KF 250 DATA 133,196,24,165,253
       ,101,195,133
HP 260 DATA 253,165,254,101,19
       6,133,254,160
BH 270 DATA 0,132,195,177,253,
       240,10,162
BX 280 DATA 8,74,38,195,202,20
       8,250,165
KD 290 DATA 195,32,210,255,166
       ,252,232,224
XR 300 DATA 8,208,136,166,251,
       232,224,25
AM 310 DATA 208,193,169,13,32,
       210,255,166
CX 320 DATA 250,202,16,181,32,
       204,255
AH 330 DATA 169,4,76,195,255,-
       1
```

Video Setup 64

Article on page 66.

```
DC 10 PRINT "64 SCREEN SETUP"
RG 20 DIM S(255)
JR 30 S0=16384
CA 40 PRINT "WANT TO USE:"
EF 50 PRINT "1. CHARACTERS
KA 60 PRINT "2. HIGH RES
CR 70 INPUT "1 OR 2";J8
RH 80 IF J8<1 OR J8>2 GOTO40
SB 90 B3=4:IF J8=2 GOTO160
DM 100 PRINT "DO YOU WANT TO B
       UILD
CX 110 PRINT "{3 SPACES}YOUR O
       WN CHARACTER SET (Y/N)"
       ;
QQ 120 INPUT Y$:Y$=LEFT$(Y$,1)
EX 130 IF Y$="Y" GOTO160
FM 140 IF Y$<>"N" GOTO90
EQ 150 B3=0:C=64
EB 160 PRINT
PA 170 PRINT "PICK A MEMORY AR
       EA:"
GD 180 FOR J=0 TO 3
EA 190 IF J8=2 OR B3>0 OR J=0
       {SPACE}OR J=2 THEN PRIN
       T J;": ";J*S0;"TO";(J+1
       )*S0-1
QC 200 NEXT J
AS 210 PRINT "YOUR CHOICE (0 T
       O 3)";:IF J8=2 THEN PRI
       NT "(1 OR 3 BEST)";
GB 220 INPUT B:IF B<0 OR B>3 G
       OTO160
XM 230 IF B=0 THEN FOR J=0 TO
       {SPACE}3:S(J)=2:NEXT J
PR 240 IF B=0 OR B=2 THEN FOR
       {SPACE}J=64 TO 127:S(J)
       =2:NEXT J
DK 250 REM
AB 260 IF J8=1 THEN PRINT "--C
       HARACTER SCREEN--":S=32
```

```
BG 270 IF J8=2 THEN PRINT "--H
       I RES SCREEN--":S=128
SG 280 ON J8 GOSUB760,800
KM 290 INPUT "ARE YOU READY FO
       R DATA";Y$
ED 300 IF LEFT$(Y$,1)<>"Y" GOT
       O290
PQ 310 PRINT "{CLR}{2 DOWN}"
BJ 320 PRINT "{5 SPACES}VIDEO
       {SPACE}LOCATIONS ";
SQ 330 PRINT
HK 340 IF B5=32 THEN PRINT "HI
       GH RESOLUTION."
GS 350 IF J8=1 THEN PRINT "TEX
       T SCREEN"
EG 360 PRINT "VIDEO MATRIX:";B
       *S0+V*64;"TO";B*S0+(V+1
       6)*64-1
PA 370 PRINT "(SPRITE POINTERS
        AT";B*S0+V*64+1016;"TO
       ";B*S0+V*64+1023;")"
AR 380 IF J8=1 AND B3=0 THEN P
       RINT "STANDARD CHARACTE
       R SET.":C=64:GOTO400
SA 390 PRINT "CHARACTER BASE:"
       ;B*S0+C*64;"TO";B*S0+(C
       +S)*64-1
MA 400 PRINT
JR 410 PRINT "POKE 56576,";MID
       $(STR$(7-B),2)
CX 420 PRINT "{4 SPACES}(TO SE
       T MEMORY BLOCK)"
KP 430 PRINT "POKE 53272,";MID
       $(STR$(V+C/16),2)
PD 440 PRINT "{4 SPACES}(TO SE
       T VM AND CB)"
MM 450 IF J8=1 THEN GOSUB1070
CG 460 PRINT "POKE 53265,";MID
       $(STR$(B5+27),2)
SH 470 IF B5<>0 THEN PRINT "
       {4 SPACES}(TO ENABLE HI
        RES)"
GE 480 IF B5=0 THEN PRINT "
       {4 SPACES}(TO KILL HI R
       ES)"
BB 490 INPUT "WILL YOU WANT SP
       RITES";Y$
KH 500 IF Y$="N" GOTO590
FG 510 IF Y$<>"Y" GOTO490
SR 520 PRINT "SPRITES MAY BE P
       LACED AT:"
QS 530 F=-1
SA 540 FOR J=0 TO 255
JJ 550 IF S(J)=0 AND F=-1 THEN
        GOSUB700
PK 560 IF S(J)<>0 AND F<>-1 TH
       EN GOSUB730
GM 570 NEXT J
KQ 580 IF F<>-1 THEN GOSUB730
QR 590 PRINT:IF B=3 GOTO630
XP 600 PRINT "CAREFUL:"
PM 610 PRINT "BASIC IS USUALLY
        IN 2049 TO 40959"
XQ 620 END
HK 630 S$="SPRITES"
GK 640 FOR J=64 TO 127 STEP 16
EG 650 IF S(J)>0 THEN S$="** W
       ARNING! **"+CHR$(13)+"A
       DDRESSES"
SA 660 NEXT J
EB 670 PRINT S$;" FROM 53248 T
       O 57343 ARE"
XR 680 PRINT "TOUGH TO GET AT"
EB 690 END
JB 700 P=J
XF 710 F=0
FC 720 RETURN
RB 730 PRINT S0*B+P*64;"TO";S0
       *B+J*64-1;"(SPRITES";P;
       "TO";J-1;")"
KQ 740 F=-1
KE 750 RETURN
CK 760 REM
XK 770 IF B3>0 THEN PRINT "THE
        CHARACTER SET MAY BE A
       T:":GOSUB840
KD 780 PRINT "VIDEO MATRIX (SC
       REEN MEMORY)...":GOSUB9
       60
KK 790 RETURN
EX 800 B5=B5+32
CX 810 PRINT "THE HI-RES SCREE
       N MAY BE AT:":GOSUB840
DB 820 PRINT "VIDEO MATRIX (CO
       LOR MEMORY)...":GOSUB96
       0
GP 830 RETURN
FQ 840 N=0:FOR J=0 TO 255 STEP
        S
BX 850 IF S(J)>T OR S(J+S-1)>T
        GOTO870
MG 860 PRINT "(";J/S;")";B*S0+
       J*64;"TO";B*S0+(J+S)*64
       -1:N=N+1:C=J/S
ER 870 NEXT J
KM 880 IF N<2 GOTO920
XR 890 PRINT "YOUR CHOICE (0 T
       O";(J-S)/S;")";
MC 900 INPUT C0:IF C0<0 OR C0>
       C GOTO840
BR 910 C=C0
SF 920 C=C*S
EA 930 FOR J=C TO C+S-1:S(J)=3
       :NEXT J
BC 940 PRINT
CD 950 RETURN
CR 960 FOR J=0 TO 255 STEP 16
HF 970 IF S(J)>T OR S(J+15)>T
       {SPACE}GOTO990
GG 980 PRINT "(";J/16;")";B*S0
       +J*64;"TO";B*S0+(J+16)*
       64-1:V=J/16
JF 990 NEXT J
MA 1000 PRINT "YOUR CHOICE (0
        {SPACE}TO";V;")";
MK 1010 INPUT C0:IF C0<0 OR C0
        >V GOTO1000
JF 1020 V=C0
PK 1030 V=V*16
DH 1040 FOR J=V TO V+15:S(J)=3
        :NEXT J
KX 1050 PRINT
FC 1060 RETURN
BB 1070 PRINT "POKE 648,";MID$
        (STR$(B*64+V/4),2)
GD 1080 PRINT "{4 SPACES}(TO C
        ONNECT 'PRINT')"
QE 1090 RETURN
```

Power BASIC:
Program Mis-Matcher

Article on page 108.

Program 1: 64/128 Program Mis-Matcher

```
KJ 10 SA=49152:CS=10600:FR=251
      :PRINT"{CLR}{WHT}"
SM 20 FORT=SATOSA+65:READA:X=X
      +A:POKET,A:NEXT
JH 30 IFX<>CSTHENPRINT"ERROR I
      N DATA STATEMENTS.":STOP
GG 40 PRINTCHR$(14)
CA 50 INPUT"NAME OF FIRST PROG
      RAM ";F1$:INPUT"NAME OF
      {SPACE}SECOND PROGRAM";F
      2$
RB 60 PRINT"{CLR}OUTPUT TO PRI
      NTER?{2 SPACES}Y/N"
EQ 70 GET SP$:IFSP$="" THEN70
GX 80 IFSP$="Y"THEN OPEN 4,4,7
      :PRINT#4,"COMPARING "F1$
      " TO "F2$".":PRINT#4
RH 90 J$="{20 SPACES}{20 LEFT}
      "
AK 100 OPEN 2,8,2,F1$:OPEN 3,8
       ,3,F2$:GOSUB650
EG 110 FORT=1TO2:GET#2,A$:GET#
       3,B$:NEXT:REM{2 SPACES}
       THROW AWAY FIRST 2 BYTE
       S
KB 120 FORT=1TO2:GET#2,A$:GET#
       3,B$:NEXT:REM{2 SPACES}
       THROW AWAY LINE LINKS
JE 130 A=0:IFA$<>""THENA=ASC(A
       $)
AA 140 B=0:IFB$<>""THENB=ASC(B
       $)
EQ 150 IF A=0 AND B=0 THEN300
BX 160 IFA=0THENLA=64000:GOTO1
       80
PG 170 GOSUB480:REM GET LINE N
       UMBER
DG 180 IFB=0THENLB=64000:GOTO2
       00
AH 190 GOSUB520:REM GET LINE N
       UMBER
JB 200 IFLA<>LB THEN GOSUB320:
       REM{2 SPACES}CHECK FOR
       {SPACE}DIFFERENT LINE #
XF 210 IFLA=64000ANDLB=64000TH
       EN300
BA 220 PRINT"CHECKING LINE"LA:
       PRINT"{UP}";
RF 230 SYS SA
SF 240 IF PEEK(FR+1)=0 THEN120
XP 250 PRINT J$ "LINES"LA"DO N
       OT AGREE."
DC 260 IF SP$<>"Y" THEN120
AG 270 IF TG=1 THEN PRINT#4
GP 280 TG=0:PRINT#4,"LINES"LA"
       DO NOT AGREE."
GE 290 GOTO120
RA 300 CLOSE2:CLOSE3:CLOSE4:EN
       D
EQ 310 REM --{37 SPACES}EXTRA
       {SPACE}LINE
JJ 320 IF LA>=LB THEN390
BX 330 PRINT J$"LINE"LA"IN
       {RVS} "F1$" {OFF} NOT I
       N {RVS} "F2$"."
SC 340 IF SP$="Y" AND TG=0 THE
       N PRINT#4
BK 350 TG=1:IF SP$="Y" THEN PR
       INT#4,"LINE"LA"IN "F1$"
        NOT IN "F2$"."
QA 360 POKE FR,2:SYS SA+55
CF 370 GET#2,A1$:GET#2,A2$:IF
       {SPACE}A1$="" AND A2$="
       " THEN LA=64000:GOTO320
PQ 380 GOSUB480:GOTO320:REM GE
       T NEW LINE #
RX 390 IF LB>=LA THEN460
XP 400 PRINT J$"LINE"LB"IN
       {RVS} "F2$" {OFF} NOT I
       N {RVS} "F1$"."
XS 410 IF SP$="Y" AND TG=0 THE
       N PRINT#4
GD 420 TG=1:IF SP$="Y" THEN PR
       INT#4,"LINE"LB"IN "F2$"
        NOT IN "F1$"."
AP 430 POKE FR,3:SYS SA+55
RH 440 GET#3,B1$:GET#3,B2$:IFB
       1$=""ANDB2$=""THENLB=64
       000:GOTO320
FX 450 GOSUB520:GOTO320
KD 460 RETURN
MR 470 REM -- GET LINE NUMBERS
AF 480 GET#2,A1$:GET#2,A2$
BQ 490 A1=0:IFA1$<>""THENA1=AS
       C(A1$)
AJ 500 A2=0:IFA2$<>""THENA2=AS
       C(A2$)
BD 510 LA=A2*256+A1:RETURN
```

```
PJ 520 GET#3,B1$:GET#3,B2$
BG 530 B1=0:IFB1$<>""THENB1=AS
       C(B1$)
DB 540 B2=0:IFB2$<>""THENB2=AS
       C(B2$)
XX 550 LB=B2*256+B1:RETURN
QR 560 DATA 169,0,133,252,162,
       2,32,198
GM 570 DATA 255,160,255,200,32
       ,207,255,240
XP 580 DATA 6,153,66,192,76,11
       ,192,132
SQ 590 DATA 251,162,3,32,198,2
       55,160,255
PB 600 DATA 200,32,207,255,240
       ,10,217,66
QP 610 DATA 192,240,245,230,25
       2,76,32,192
DS 620 DATA 196,251,240,2,230,
       252,96,166
JF 630 DATA 251,32,198,255,32,
       207,255,208
BH 640 DATA 251,96
QQ 650 OPEN15,8,15:INPUT#15,A,
       B$,C,D:IFATHENPRINTA,B$
       ,C,D:STOP
AB 660 RETURN
```

Program 2: Modifications For Plus/4 And 16

```
CC 5 POKE 56,62:CLR
JA 10 SA=15872:CS=9528:FR=159:
      PRINT"{CLR}{BLK}"
FX 560 DATA 169,0,133,160,162,
       2,32,198
GM 570 DATA 255,160,255,200,32
       ,207,255,240
KM 580 DATA 6,153,66,62,76,11,
       62,132
GJ 590 DATA 159,162,3,32,198,2
       55,160,255
PB 600 DATA 200,32,207,255,240
       ,10,217,66
PM 610 DATA 62,240,245,230,160
       ,76,32,62
EP 620 DATA 196,159,240,2,230,
       160,96,166
DM 630 DATA 159,32,198,255,32,
       207,255,208
BH 640 DATA 251,96
```

Mastering 128 Sound And Music

Article on page 88.

Program 1: Custom Envelope

```
HA 10 TEMPO 8:VOL 8:PLAY"X0U9"
RS 20 INPUT"{CLR}{DOWN}DEFAULT
       ENVELOPE TO COMPARE (0-
      9)";E:IF E<0 OR E>9 THEN
      20
EX 30 PRINT"{2 DOWN}{RVS}FOR C
      USTOM ENVELOPE{OFF}
      {DOWN}":INPUT"ATTACK RAT
      E (0-15)";A:IF A<0 OR A>
      15 THEN30
EH 40 INPUT "DECAY RATE (0-15)
      ";D:IF D<0 OR D>15 THEN4
      0
RD 50 INPUT"SUSTAIN LEVEL (0-1
      5)";S:IF S<0 OR S>15 THE
      N50
CE 60 INPUT"RELEASE RATE (0-15
      )";R:IF R<0 OR R>15 THEN
      60
JG 70 INPUT"WAVEFORM (0-4)";W:
      IF W<0 OR W>15 THEN70
FK 80 IF W<>2 THEN100
KH 90 INPUT"PULSE WIDTH (0-409
      5)";P:IF P<0 OR P>4095 T
      HEN90
KQ 100 PRINT"{DOWN}PRESS P TO
       {SPACE}PLAY AND COMPARE
        YOUR CUSTOM":PRINT USI
       NG"ENVELOPE TO DEFAULT
       {SPACE}ENVELOPE #";E
SP 110 PRINT"{DOWN}PRESS C TO
       {SPACE}CHANGE YOUR CUST
       OM ENVELOPE":PRINT"
       {DOWN}PRESS D TO CHANGE
        THE DEFAULT ENVELOPE":
       PRINT"FOR COMPARISON"
CJ 120 GET X$:IF X$="P" THEN18
       0
HH 130 IF X$="C" THEN PRINT"
       {CLR}":GOTO30
KF 140 IF X$="D" THEN160
SP 150 GOTO120
PK 160 INPUT"{CLR}{DOWN}DEFAUL
       T ENVELOPE TO COMPARE (
       0-9)";E:IF E<0 OR E>9 T
       HEN160
EP 170 GOTO100
HB 180 A$="V1O4QCIDIEIFIGIAIBO
       5WCQR":B$="V2O5QCO4IBIA
       IGIFIEIDWCQR":PLAY"V1T1
       V2T2"
SC 190 PRINT USING"{DOWN}{OFF}
       {6 SPACES}THIS IS DEFAU
       LT ENVELOPE #";E:T$=STR
       $(E):ENVELOPE 0,0,9,0,0
       ,2,1536
JP 200 PLAY"V1T":PLAY T$:PLAY
       {SPACE}A$:PRINT"{UP}
       {6 SPACES}{RVS}THIS IS
       {SPACE}YOUR CUSTOM ENVE
       LOPE":ENVELOPE 0,A,D,S,
       R,W,P
QM 210 PLAY"V2T0":PLAY B$:PRIN
       T"{UP}{34 SPACES}":GOTO
       120
```

Program 2: VF16

```
MB 10 PRINT"{CLR}{5 DOWN}{TAB}
      {2 SPACES}VISION FUGITIV
      E XVI":PRINT"{5 DOWN}
      {2 TAB}{3 SPACES}BY":PRI
      NT"{5 DOWN}{TAB}
      {3 SPACES}SERGEI PROKOFI
      EV"
JS 20 TEMPO 6:ENVELOPE 0,0,9,2
      ,1,2,1536:PLAY"X0U9":PLA
      Y"V1T0V2T0V3T0"
CC 30 A$="V1O5HEV3QRO4HEV1O5Q#
      DV2HFV1QDV3O4HE"
BS 40 B$="V1O5Q#CV2HEV1QCV3O4H
      EV1O4QBV2O5H#DV1O5ICV3O4
      HEV1IB"
BS 50 C$="V1O4Q#FV2O5HDV1O4Q#G
      V3HEV1QAV2O5H#CV1O4I#AV3
      HEV1IB"
EF 60 D$="V1O5QCV2HCV1I#CV3O4H
      EV1O5ID.Q#DV2O4HBV3HEV1O
      5SES#G":VOL 9:PLAY A$:PL
      AY B$:VOL 7:PLAY C$:VOL
      {SPACE}9:PLAY D$
QK 70 E$="V1O5HEV2O4H#AV3HEV2O
      5HFV1Q#DQDV3O4HE":F$="V1
      O5Q#CV2HEV1QCV3O4HEV1QBV
      2O5H#DV1ICV3O4HEV1IB"
QQ 80 G$="V1O4Q#FV2O5HDV1O4Q#G
      V3HEV1QAV2O5H#CV1O4I#AV3
      HEV1IB"
FQ 90 H$="V1O5HCV2HCV3O4HEV2HB
      V1O5HEV3O4QE"
KX 100 VOL 11:PLAY E$:PLAY F$:
       VOL 9:PLAY G$:VOL 7:TEM
       PO 5:PLAY H$:TEMPO 6
HS 110 I$="V3O3SEV2O4IGV1IBIRV
       3O3SBSRO4SFV2QDV1QAV3SR
       O3SBSRO2SAV1O4IEIRV3O3S
       FSRSBV1O4QDV3SRO3SFSR"
CS 120 J$=I$:K$="V3O3SEV1O4IEI
       RV3O3SBSRO4SFV1QDV3SRO3
       SBSRO2SAV2O4IGV1IBIRV3O
       3SFSRSBV2O4QDV1QAV3SRO3
       SFSR"
QC 130 L$="V3O3SEV1O4IEIRV3O3S
       BSRO4SFV1QDV3SRO3SBSRO2
       SAV1O4HEV3SRO3SFSRSBSR.
       IFV2IR"
CB 140 VOL 5:PLAY I$:PLAY J$:P
       LAY K$:PLAY L$
AX 150 M$="V2IRV1O4ICIRV3O3SAS
       RO4SFV1QDV3SRO3SASRSCV2
       O4IAV1O5ICIRV3O3SGSRO4S
       CV2QEV1QBV3SRO3SGSR"
EA 160 N$="V3O3SFV1O4IDIRV3O3S
       ASRO4SGV1QEV3SRO3SASRSC
       V2O4IBV1O5IDIRV3O3SASRO
       4SEV2QFV1O5QCV3SRO3SASR
       "
QQ 170 O$="V3O3HBV1O4IGIRV2SES
       RSDV1QFV2SRICIRV1IBV3O3
       QAV2O4SCSRSDV3QFV1QAV2S
       RIE"
MM 180 P$="V2IRV1O4IGV3O3HBV2O
       4SESRSDV1QFV2SRICIRV1IB
       V3O3QAV2O4SCSRSDV3QFV1Q
       AV2SRIE"
CB 190 PLAY M$:VOL 7:PLAY N$:P
       LAY O$:PLAY P$:Q$="V2IR
       V1O4HGV3O3WBV2O4SCSRSDS
       RIEIRV1HFV2SDSRSCSRID"
GM 200 R$="V2O4HDV1HGV3O3SBSRS
       ASRSGSRSFSRHEV2O4HEHR"
SR 210 S$=A$:T$=B$:PLAY Q$:VOL
        5:TEMPO 5:PLAY R$:TEMP
       O 6:VOL 9:PLAY S$:PLAY
       {SPACE}T$:U$=C$
BJ 220 V$="V1O5HCV2WCV3O4WEV1O
       6.HC":W$="V2QRO3QAV3QDV
       1O4QAQGV3O3QCV2QGQFV3O2
       QBV1O4QF"
BH 230 X$="V1O5HEV3O4QEHEV1O5Q
       #DV2HFV1QDV3O4HE":PLAY
       {SPACE}U$:PLAY V$:VOL 7
       :PLAY W$:PLAY X$
QG 240 Y$=T$:Z$=U$:AA$=V$:AB$=
       W$:PLAY Y$:PLAY Z$:PLAY
        AA$:TEMPO 5:PLAY AB$:A
       C$=X$:AD$=Y$
RS 250 AE$="V1O4Q#FV2O5HDV1O4Q
       #GV3HEV1QAV2O5H#CV1O4I#
       AV3QEV1IB"
CE 260 AF$="V1O5HCV3QCO4QEQCV1
       O6HEV3O3QE"
ES 270 VOL 5:PLAY AC$:PLAY AD$
       :PLAY AE$:PLAY AF$
JK 280 AG$="V3O3WEV1O6WE":AH$=
       "V1O6.WEV2O5.WEV3O3.WE"
       :PLAY AG$:VOL 3:PLAY AH
       $:END
```

Sensational Prices!
. . . On Our Most Popular Items!

from microPal® . . .

THE 59¢ DISKETTE!

Are you paying too much for diskettes? Try our first quality, prime, 5¼" diskettes (no rejects, no seconds) at these fantastic sale prices and save, save, SAVE! Disks are packaged in boxes of 50; each box contains 5 shrink-wrapped 10-packs that include diskettes in sleeves, labels, and write-protect tabs.

Each diskette is certified to be 100% error free and comes with a lifetime warranty (if you have a problem, we'll replace the diskette). All diskettes include hub reinforcement rings and write-protect notch.

All diskettes are double density and work in either single or double density drives.

SS, DD Diskettes, Box of 50
32391 **$29.50–59¢ ea.!**

DS, DD Diskettes, Box of 50
32403 **$34.50–69¢ ea.!**

$ LOWEST PRICES IN U.S.A.! $

star MICRONICS INC

SEIKOSHA ANCHOR AUTOMATION
EPSON XETEC INDUS

We can offer you some of the lowest prices in the country on the most popular printers, monitors and interfaces. Our normal prices are already low, but to make sure you get the best deal you can, we will also meet most competitive prices in this publication when placed on an equal basis *(Remember—we don't charge for use of your credit card, impose excessive shipping fees, or use any other hidden extras to boost the price you pay. Due to the rapid change in prices in the computer industry, we can only meet prices at the time you place your order; we cannot adjust prices on items ordered or shipped on an earlier date.)* Another plus for charge card customers — your charge card is billed at time of shipment only for the items shipped — no early billing, no long wait for the merchandise you already paid for.

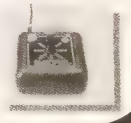
COMMODORE		EPSON		FAMOUS NAME SOFTWARE
C-128™ Computer	$CALL	FX-85	$CALL	Epyx
1571 Disk Drive	$CALL	FX-286	$CALL	Broderbund
1902A Monitor	$CALL			Abacus
1670 Modem	$CALL	STAR MICRONICS		Electronic Arts
		NX-10	$CALL	Timeworks
		NX-10C	$CALL	MicroProse
		NL-10	$CALL	Activision, and many more!

★ THE BEST PRICES ★
★ THE BEST SERVICE ★
WHY SHOP ANYWHERE ELSE?

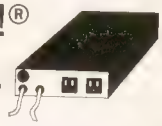
THE FAMOUS SLIK STIK™

ONLY $6.95!

The Slik Stik™ has been a favorite for years . . and for good reason. It's just the right combination of responsiveness and accuracy And the price can't be beat! From Suncom. 90 day warranty. Connects directly to Commodore Computers
42086 **$6.95**



POWER and PROTECTION FOR YOUR C-64!®



POW'R PAK 64
from MicroPal®

Pow'r Pak is a replacement power supply (1.5 amp) for the Commodore 64® . . . but that's not all! Pow'r Pak also supplies two additional surge protected outlets (120V) for monitor, disk drive, or other peripherals. On/off switch. Fuse protection. Sturdy all-metal casing is ventilated for heat dissipation. Full 1 year warranty.
34910 **$49.95**

EDUCATORS!

We have a catalog *just for you!* It's chock full of software, hardware and accessories designed for use in schools . . . from elementary to college level. Products are for Apple, IBM, Commodore, TI and other computers used in schools across the country. And here's the best part our low, low prices will stretch your dollars farther and let you accomplish more.

Call 1-800-348-2778 now and request our Education Catalog!

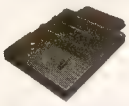
Home Automation Is Here

X-10 POWERHOUSE™

With your Commodore 64 or 128 computer and the X-10 Powerhouse Interface, you can program lights and appliances to turn on and off, control your thermostat, and much more. The user-friendly Powerhouse software lets you first "set up" your house then the on screen software shows you how to set a module for each light and appliance to be controlled. Once you've established the program, you can disconnect the computer the Powerhouse system will control your home independently Up to 256 lamps and appliances can be controlled using X-10 type modules Enter the age of electronic living! **Was $125.00**

36493 X-10 Powerhouse Interface, Commodore Cable & software **Now Only $49.95**
37001 Lamp Module **$13.95** **37016** 2-Pin Appliance Module **$13.95**
37020 Wal Switch Module **$13.95** **29605** 3 Pin Appliance Module **$19.95**

CARTRIDGE EXPANDER



Plus $22.95 *FAST LOAD* OFFER!

Stop wearing out your computer by endless cartridge swapping! The Navarone cartridge expander features 3 cartridge slots. Reset the computer independently of the power switch. Cartridge slots are vertical for easy access — no blind fumbling behind the computer.
33227 3-slot Cartridge Expander **$22.95**

The cartridge expander is a great companion for the Epyx Fast Load cartridge — you can keep it permanently installed plus have two slots free for other cartridges!
34216 Fast Load Cartridge (Sug. Retail $39.95) **$24.95**

Fast Load Only $22.95 with purchase of cartridge expander!

DUST COVER and "EVERYTHING BOOK" SPECIAL OFFER

Get to know us by ordering this great dust cover for your C-64 or C-128 and our catalog, "The Everything Book for the C-64 and C-128 Home Computers," for $2.95 (no extra shipping and handling charges). Cover is antistatic, translucent 8-gauge vinyl sewn to our exacting standards with reinforced seams. Discover the savings and easy shipping available from TENEX Computer Express!

$2.95

31627 C-64 Dust Cover and Catalog (G1W)
38464 C-128 Dust Cover and Catalog (G1W)

The Right Interface For All Your Printing Needs!!

PPI with graphics

" a sound investment for your Commodore" RUN, Dec '85 This high performance graphics parallel printer interface from DSI for C-64 and VIC-20 emulates a Commodore printer Comes with cables and user's manual
33565 **$39.95**

Super Graphix. Features 8K buffer, 10 printing modes, 3 internal screen dumps and top mounted dip switches Supports superscript, subscript, underlining, bold face, and a choice of 9 character widths. From Xetec.
41769 **$69.95**

Super Graphix Jr. A more economical version of the Super Graphix, featuring graphics, normal and correspondence quality printing Compatible with all major printers From Xetec
41774 . . . . . **$49.95**

From Your Friends At
TENEX Computer Express

We gladly accept mail orders!
P.O. Box 6578
South Bend, IN 46660
Questions? Call 219/259-7051

Ad G1W

SHIPPING CHARGES

ORDER AMOUNT	CHARGE
less than $20.00	$3.75
$20.00–$39.99	4.75
$40.00–$74.99	5.75
$75.00–$149.99	6.75
$150.00–$299.99	7.75
$300 & up	8.75

MasterCard VISA

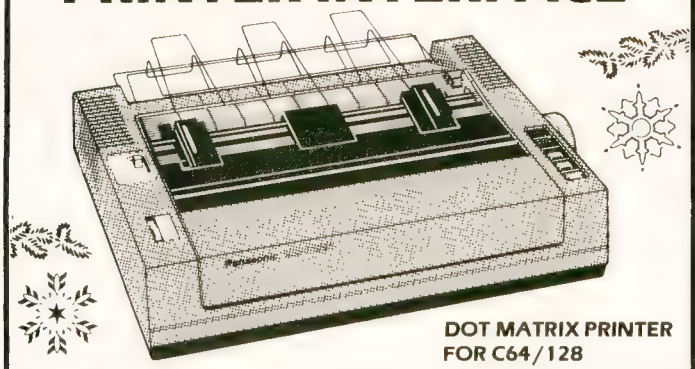
NO EXTRA FEE FOR CHARGES
WE VERIFY CHARGE CARD ADDRESSES
ORDER TOLL FREE
1-800-348-2778
INDIANA ORDER LINE 1-800-225-6838

COMMODORE 64 is a registered trademark; and COMMODORE 128 is a trademark of Commodore Electronics, Ltd. Foreign Orders add $4.00. Heavy items ship at actual cost.

Panasonic
Office Automation OA

SUPER CHRISTMAS PRINTER PACKAGE

PANASONIC KX 1091 AND XETEC SUPER GRAPHIC PRINTER INTERFACE



DOT MATRIX PRINTER FOR C64/128

KX 1091 PRINTER FEATURES:

- Compatible with popular small business and personal computers
- Up to 120 cps printing speed
- Draft, near letter quality, and graphics
- Convenient switch indicator for print mode selection
- Standard parallel interface Optional RS232C interface
- Bi-directional printing with logic seeking capabilities
- Adjustable tractor and friction feed
- Easy loading ribbon cartridge
- LIMITED 2-YEAR WARRANTY

SUPER PRINTER PACKAGE PRICE BOTH FOR ONLY $269

EST. 1982
ComputAbility™

P.O. BOX 17882
MILWAUKEE, WI 53217

ORDER LINES OPEN
MON.-FRI. 11 A.M. - 7 P.M. CST
SAT. 12 P.M. - 5 P.M. CST

TO ORDER CALL TOLL FREE
800-558-0003

FOR TECHNICAL INFORMATION, ORDER INQUIRIES, OR FOR WIS. ORDERS
414-351-2007

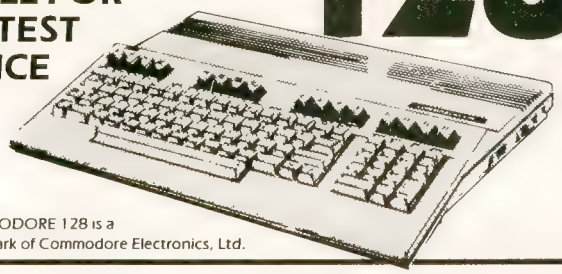
ORDERING INFORMATION FOR FAST DELIVERY. SEND CASHIER'S CHECK, MONEY ORDER OR DIRECT BANK TRANSFER, PERSONAL AND COMPANY CHECKS ALLOW 14 BUSINESS DAYS TO CLEAR. CHARGES FOR C.O.D. ARE $3.00 IN CONTINENTAL U.S.A. INCLUDE 4% SHIPPING ON ALL ORDERS, MINIMUM $4.00. MASTER CARD & VISA ORDERS PLEASE INCLUDE CARD #, EXPIRATION DATE AND SIGNATURE. WI RESIDENTS PLEASE ADD 5% SALES TAX. HI, AK, FPO, APO, PUERTO RICO AND CANADIAN ORDERS PLEASE ADD 5% SHIPPING AND HANDLING. MINIMUM $5.00, ALL OTHER FOREIGN ORDERS PLEASE ADD 15%. SHIPPING, MINIMUM $10.00. ALL GOODS ARE NEW AND INCLUDE FACTORY WARRANTY. DUE TO OUR LOW PRICES ALL SALES ARE FINAL. ALL DEFECTIVE RETURNS MUST HAVE A RETURN AUTHORIZATION NUMBER. PLEASE CALL 414-351-2007 TO OBTAIN A RA# OR YOUR RETURN WILL **NOT** BE ACCEPTED FOR REPLACEMENT OR REPAIR. PRICES AND AVAILABILITY SUBJECT TO CHANGE WITHOUT NOTICE.

NOTE ON ALL ORDERS OUTSIDE CONTINENTAL U.S.A. WE SHIP ALL ORDERS FIRST CLASS INSURED U.S. MAIL. **IF SHIPPING CHARGES EXCEED THE MINIMUM AMOUNT** YOU WILL BE CHARGED THE ADDITIONAL AMOUNT TO GET YOUR PACKAGE TO YOU QUICKLY AND SAFELY.

MasterCard VISA **NO SURCHARGE ON CREDIT CARDS**

COMMODORE 128 PERSONAL COMPUTER

CALL FOR LATEST PRICE



COMMODORE 128 is a trademark of Commodore Electronics, Ltd.

1571 DISK DRIVE **239**	1670 MODEM **139**
1902 MONITOR CALL FOR LATEST PRICE	1750 RAM EXPANDER . . **169**
MPS 1000 PRINTER . . . **249**	1350 MOUSE CONTROLLER . **44.95**

COMMODORE 64C

NEW COMMODORE 64C WITH GEOS . . . **189**

1350 MOUSE . . **44.95**	1802C MONITOR . . 209
1541C DISK DRIVE . . . CALL	1660 MODEM . **54.95**

EST. 1982
ComputAbility™

P.O. BOX 17882
MILWAUKEE, WI 53217

ORDER LINES OPEN
MON.-FRI. 11 A.M. - 7 P.M. CST
SAT. 12 P.M. - 5 P.M. CST

TO ORDER CALL TOLL FREE
800-558-0003

FOR TECHNICAL INFORMATION, ORDER INQUIRIES, OR FOR WIS. ORDERS
414-351-2007

ORDERING INFORMATION FOR FAST DELIVERY. SEND CASHIER'S CHECK, MONEY ORDER OR DIRECT BANK TRANSFER, PERSONAL AND COMPANY CHECKS ALLOW 14 BUSINESS DAYS TO CLEAR. CHARGES FOR C.O.D. ARE $3.00 IN CONTINENTAL U.S.A. INCLUDE 4% SHIPPING ON ALL ORDERS, MINIMUM $4.00. MASTER CARD & VISA ORDERS PLEASE INCLUDE CARD #, EXPIRATION DATE AND SIGNATURE. WI RESIDENTS PLEASE ADD 5% SALES TAX. HI, AK, FPO, APO, PUERTO RICO AND CANADIAN ORDERS PLEASE ADD 5% SHIPPING AND HANDLING. MINIMUM $5.00, ALL OTHER FOREIGN ORDERS PLEASE ADD 15%. SHIPPING, MINIMUM $10.00. ALL GOODS ARE NEW AND INCLUDE FACTORY WARRANTY. DUE TO OUR LOW PRICES ALL SALES ARE FINAL. ALL DEFECTIVE RETURNS MUST HAVE A RETURN AUTHORIZATION NUMBER. PLEASE CALL 414-351-2007 TO OBTAIN A RA# OR YOUR RETURN WILL NOT BE ACCEPTED FOR REPLACEMENT OR REPAIR. PRICES AND AVAILABILITY SUBJECT TO CHANGE WITHOUT NOTICE.

NOTE ON ALL ORDERS OUTSIDE CONTINENTAL U.S.A. WE SHIP ALL ORDERS FIRST CLASS INSURED U.S. MAIL. IF SHIPPING CHARGES EXCEED THE MINIMUM AMOUNT YOU WILL BE CHARGED THE ADDITIONAL AMOUNT TO GET YOUR PACKAGE TO YOU QUICKLY AND SAFELY.

MasterCard VISA NO SURCHARGE ON CREDIT CARDS

NX-10 PRINTER & XETEC SUPER GRAPHIC INTERFACE
$299
This is a SHIPPED PRICE anywhere in continental USA

PANASONIC 1091 & XETEC SUPER GRAPHIC INTERFACE
$279
This is a SHIPPED PRICE anywhere in continental USA

C-128 Computer 1902A RGB Monitor
1571 Disk Drive 1750 RAM Expander
1670 Modem 1350 Mouse
MPS 1000 Printer
Call for Latest Prices

AMIGA COMPUTER SYSTEM
Call for Price and Availability

Star Micronics Inc

NX-10	Call
NL-10C	Call
NX-10C	Call
SD-10	339
SD-15	449
SG-15	369
SR-15	Call

Commodore 64C W/Geos
1541C Disk Drive
1802C Monitor
1581C 3.5 Disk Drive
Call for Latest Prices

PRINTERS

Legend 1080	209
Legend 808	169
Panasonic 1091	219
Silver Reed	Call
Epson	Call
Juki 5510	Call
Toshiba 321	529

MONITORS

NAP Amber	89.95
Thommson	Call
Goldstar Color	Call
Teknika RGB	Call
Magnovox RGB	Call
Commodore 1902	289

COMMODORE 64 SOFTWARE

ABACUS 64

Chartpak	31.95
Cad-Pak	31.95
Powerplan	31.95
Super C Compiler	44.95
Super Pascal	44.95
Basic Compiler	31.95
Forth	31.95

ACCESS

Mach V-Cart	21.95
Leader Board	24.95
Tournament Disk	16.95
Tenth Frame	24.95
Executive Disk	16.95
Robotic Workshop	Call

ACTIVISION

Gamemaker	27.95
Hacker	20.95
Computer Ltl People	23.95
Borrowed Time	20.95
2 on 2 Basketball	23.95
Murder/Mississippi	23.95
Hacker II	23.95
Tass Times	23.95
Shanghai	23.95
Champ. Baseball '86	23.95
Game. Sports Library	16.95
Game. Science Fiction	16.95
Transformers	23.95

BRODERBUND

Bank Street Series-Ea.	34.95
Graph Libr. 1, 2, 3 or 4	17.95
Prt Shop Companion	27.95
Toy Shop	39.95
Holiday Graph Library	17.95

ELECTRONIC ARTS

Archon	11.95
Archon II	24.95
Mule	11.95
Murder/Zinderneuf	19.95
Music Construction	11.95
Pinball Construction	11.95
Skyfox	24.95
One on One	11.95
Seven Cities of Gold	11.95
Mail Ord. Monsters	11.95
Marble Madness	24.95
Arctic Fox	24.95
Amnesia	27.95
Bard's Tale II	27.95
Moebius	41.95
Murder Party	24.95
Robot Rascal	27.95
Ultima I	27.95
Racing Destruction	11.95
Adventure Constr.	29.95
Fin. Cookbook	29.95
Bard's Tale	27.95
Europe Ablaze	33.95
Touchdown Football	11.95
Lords of Conquest	24.95
Chessmaster 2000	27.95
Ultimate Wizard	24.95
Super Boulderdash	11.95
Autoduel	34.95
Ogre	27.95
Heart of Africa	11.95
Hacker	29.95
Mindshadow	29.95
Borrowed Time	29.95
Lit'l Comp. People	34.95
Music Studio	39.95
Mastertype	27.95
Keyboard Cadet	29.95
VIP Professional	Call
Racter	29.95
Analyze	69.95
On-Line	49.95
Scribble	69.95
BBS-PC Bulletin Board	69.95
Archon	29.95
One on One	29.95
7 Cities of Gold	29.95
Starfleet I	38.95
Microleague Baseball	39.95
Impact	129.95
Computer Baseball	27.95
Shanghai	29.95

AMIGA SOFTWARE

Skyfox	29.95
Artic Fox	29.95
Marble Madness	34.95
Return/Atlantis	29.95
Fin. Cookbook	34.95
Adventure Const.	29.95
Chessmaster 2000	32.95
Instant Music	34.95
Deluxe Print	69.95
Deluxe Video	69.95
Deluxe Paint	69.95
Print Utility 1	20.95
Print Utility 2	20.95
Aegis Draw	134.95
Aegis Animator/ Images	99.95
The Pawn	29.95
Organize	69.95
Printmaster	32.95
Art Gallery 1 or 2	19.95
King Quest II	34.95
Black Cauldron	34.95
Ultima 3	41.95
Maxiplan	99.95
Maxidesk	49.95
Maxicom	39.95
Flight Simulator II	34.95
Silent Service	27.95
Mean 18	34.95
Leader Board	29.95
Winter Games	27.95
Rogue	27.95
Apshai Trilogy	27.95
Strip Poker	29.95
Brataccas	34.95
Halley's Project	29.95
Kid Talk	39.95
Speller Bee	39.95
Paper Clip Elite	84.95
Degas Elite	52.95
Jet	34.95
Hacker II	34.95
Zumafont	23.95
Diablo	23.95
Hex	27.95
Delta Patrol	19.95
Monkey Business	19.95
Winnie The Pooh	19.95
Infocom	Call
DB Man	99.95
Lattice C	Call
LPD Writer	79.95
LPD Planner	79.95
LPD Filer	79.95
Superbase Amiga	99.95
Super Huey	27.95
Gizmo	34.95
Digital Link	54.95
Logistics	169.95
Autoduel	34.95
Bard's Tale	34.95
Music Construction 2.0	69.95
Aegis Art Vol. I	23.95
Coveted Mirror	20.95

COMMODORE 128 SOFTWARE

Superbase 128	69.95
Swiftcalc w/Sidewy	49.95
Wordwriter 128	49.95
Data Manager II	49.95
Fleet System III	54.95
Home Pak	34.95
Superscript128/Spell	54.95
Perfect Writer	49.95
Sylvia Porter-128	49.95
Paperback Writer	32.95
Paperback Filer	32.95
Basic Compiler 128	44.95
Chart-Pak 128	31.95
Cad-Pak 128	44.95
Super C Compiler	44.95
Cobol 128	44.95
Speed Term 128	31.95
Mach V/128	32.95
Perfect Filer	49.95
Trinity	27.95
Paperback Planner	32.95
Vizistar 128	Call
Partner 128	49.95

SUPER SPECIALS* FOR C-64/C-128
ELECTRONIC ARTS®

Skyfox 21.95	Bard's Tale 25.95	Robot Rascals 25.95
Marble Madness 22.95	Bard's Tale II 25.95	Autoduel 32.95
Artic Fox 21.95	Murder Party 21.95	Battle Front 25.95
Amnesia 25.95	Lords of Conquest 21.95	Ogre 25.95
		Moebius 38.95

*Special Prices Effective Now Thru December 31, 1986

EPYX

Fast Load-Cart	24.95
The Eidolon-D	24.95
Winter Games	24.95
Summer Games II-D	24.95
Multiplan 64/128	44.95
Vorpal Utility	22.95
Movie Monster	24.95
World Karate	19.95
Super Cycle	24.95
Champion Wrestling	24.95
World Games	24.95
Destroyer	24.95

Buy the EPYX 500XJ Joystick for only $12.95 When Combined With Any Other Purchase

INFOCOM
Call for items and prices

ELECTRIC DREAMS

Rocky Horror Show	20.95
Zoids	20.95
Spindizzy	20.95

MICROPROSE

Silent Service	23.95
Gunship	23.95
Accrojet	17.95
Top Gunner	17.95
F-15 Strike Eagle	23.95
Kennedy Approach	17.95
Crusade in Europe	27.95
Conflict in Vietnam	27.95
Decision in the Desert	27.95

MINDSCAPE

Crossword Magic	34.95
Perfect Score	49.95
Halley Project	20.95
High Roller	20.95
Shadowfire	20.95
Lords of Midnight	20.95

MINDSCAPE

Infiltrator	20.95
Bop 'N' Wrestle	20.95
Spell/Destruction	20.95
Fairlight	20.95
Indoor Sports	20.95
American Challenge	20.95

SSI

Wizard's Crown	27.95
Professional Tour Golf	24.95
Broadsides	24.95
Field of Fire	24.95
Carrier Force	37.95
Computer Ambush	37.95
Kampfgruppe	37.95
Imperium Galacticum	24.95
Phantasie	24.95
Phantasie II	27.95
Mech Brigade	37.95
Rings of Zilfin	27.95
Gettysburg	39.95
Battle Group	39.95
Shard of Spring	27.95
Roadwar 2000	27.95
Warship	39.95
Gemstone Healer	20.95

TIMEWORKS

Business Systems	39.95
Wordwriter/Spell	34.95
Swiftcalc/Sideways	27.95
Data Manager II	27.95
Sylvia Porter 64	34.95
Evelyn Wood	27.95
Sideways	20.95
Partner 64	39.95

MISCELLANEOUS 64

Hitchiker	24.95
Enchanter	24.95
Sorcerer	27.95
Karateka	20.95
Spellbreaker	29.95
Leather Goddess	23.95
Moonmist	23.95
Agatha Christie	22.95
Business Form Shop	27.95
Golden Pass	29.95

EST. 1982

ComputAbility

P.O. Box 17882, Milwaukee, WI 53217
ORDER LINES OPEN
Mon-Fri 11 a.m. - 7 p.m. CST • Sat 12 p.m. - 5 p.m. CST

To Order Call Toll Free

800-558-0003

For Technical Info, Order Inquiries, or for Wisc. Orders

414-351-2007

ORDERING INFORMATION: Please specify system. For fast delivery send cashier's check or money order. Personal and company checks allow 14 business days to clear. School P.O.'s welcome. **C.O.D. charges are $3.00.** In Continental U.S.A. include $3.00 for software orders. 4% shipping for hardware, minimum $4.00. MasterCard and Visa orders please include card # expiration date and signature. WI residents please include 5% sales tax. HI, AK, FPO, APO, Puerto Rico and Canadian orders please add 5% shipping, **minimum $5.00.** All other **foreign orders add 15% shipping, minimum $10.00.** All orders shipped outside the Continental U.S.A. are shipped first class insured U.S. mail. If foreign shipping charges exceed the minimum amount, you will be charged the additional amount to get your package to you quickly and safely. All goods are new and include factory warranty. Due to our low prices all sales are final. **All defective returns must have a return authorization number.** Please call 414-351-2007 to obtain an R.A. #, or your return will not be accepted. Prices and availability subject to change without notice.

MasterCard

VISA

No surcharge for MasterCard or Visa

XETEC SUPER-GRAPHIC INTERFACE
69.95
SPECIAL GOLDSTAR 13" COLOR COMPOSITE MONITOR
134.95 delivered

MODEMS

Commodore 1660	54.95
Commodore 1670	139

COMMODORE SOFTWARE

MISCELLANEOUS 64

Tracker	29.95
Pet Speed	34.95
Oxford Pascal	34.95
Geos Desk Pak	23.95
Geos Font Pak	20.95
Home Pak	16.95
I Am The 128	23.95
Paper Clip/Spell	49.95
Consultant	39.95
B/Graph 128	54.95
Breakers	27.95
Reach For The Stars	29.95
Carrier at War	34.95
Sublogic Football	29.95
Printmaster	21.95
Art Gallery 1 or 2	17.95
Superbase 64	47.95
Ultima II	39.95
Ultima III	34.95
Ultima IV	41.95
Newsroom	34.95
Clip Art I	19.95
Clip Art II	27.95
Graphics Expander	23.95
Certificate Maker	34.95
Flight Simulator II	34.95
Brimstone	27.95
The Hobbitt	23.95
Animation Station	49.95
Karate Champ	23.95
Kung Fu Master	23.95
Commando	23.95
Tag Team Wrestling	23.95
Sublogic Baseball	34.95
Blazing Paddles	24.95
Math Blaster	34.95
Hardball	19.95
Fight Night	19.95
PSI 5 Trading Co.	19.95
Decepto:	19.95
Ace of Aces	19.95
Accolade Football	19.95
Kill Until Dead	19.95
Jet	29.95
Alternate Realty/ City	24.95
Alt. Reality/ Dungeon	24.95
Mercenary	18.95
221 Baker Street	18.95
Neverending Story	18.95
Fontmaster 2	32.95
Star Rank Boxing	20.95
On Court Tennis	20.95
The Pawn	29.95
A.C.E.	16.95
Geos	39.95
Light Lab	34.95
Disney Comics Strip	23.95
Disney Card & Party	23.95
Dr. Ruth's Game/Sex	23.95
Lasser Money Mgr.	47.95
Guild of Thieves	29.95
WWF Micro Wrestling	27.95
Stafleet I	34.95
Type	27.95
Battle Fronts	27.95
Elite	23.95

commodore AUTHORIZED REPAIR
CALL FOR LOW PRICES!

OVER 2000 SOFTWARE TITLES IN STOCK

commodore 64 EDUCATOR

SCHOOL P.O.'s ACCEPTED
☑ LIFETIME WARRANTY
☑ TYVEK SLEEVES • LABELS
WRITE PROTECTS • PACKAGED
100 up 50-99
GENERIC SS/DD .40 .55

NEW LOW PRICES

Commodore Hardware we will BEAT any price in this issue!

commodore SX 64

LIMITED QUANTITY 349.95

BY COMMODORE AMIGA™
SPECIAL PACKAGES
NEW LOW PRICE
CALL!

M.C.S.
MicroComputer Services
ORDERS ONLY 800-433-7756
In Michigan [313] 427-0267
INFO & CUSTOMER SERVICE — [313] 427-0267
HOURS: MON - SAT 10:00 A.M. - 8:00 P.M.
12864 Farmington, Livonia, MI 48150

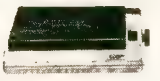
Canon PJ-1080A
COLOR INK JET
$249.95
LIMITED QUANTITY

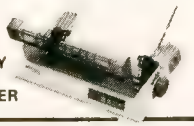
commodore SFD 1001

179.95

1200 BAUD

FROM $88.00

NEW! star LV-1210
FROM $179.95
N.L.Q. • 120 CPS
FRICTION • TRACTOR
ALL STAR PRINTERS ON SALE


SEIKOSHA SP-1000VC
COMMODORE READY
$164.95
NEAR LETTER QUALITY
FRICTION & TRACTOR
100 CPS • SHEET FEEDER


COMREX CR-220
$79.95
COMMODORE READY
FROM EPSON
50 CPS • TRACTOR FEED

We Bought 'em All
FAR BELOW DEALER COST
RETAIL 499.95
REGULAR DEALER COST 325.00

• 100% C-64 Compatible
• Built in Hi-Res Green Monitor
• Heavy duty power supply and sturdy case
• All units completely refurbished with full 90 day warranty
$199.95
DEALER PRICING AVAILABLE
ATTENTION SCHOOLS – BIG SPECIALS ON PET/CBM

MC/VISA/C.O.D.
Please include phone number. Dealer Inquiries Invited. All prices discounted for cash or check, add 3% for MC/VISA. Shipping: Printers $10.00, Educator $20.00, Disks $6.00 per 100, (West Coast — add $2.00 per order). Add $3.00 for C.O.D. Reduced shipping for large quantities. Prices and availability subject to change without notice. ALL MERCHANDISE CARRIES MANUFACTURERS WARRANTY

GREAT PRODUCTS FOR YOUR COMMODORE

promenade C1™

The Eprom Programmer. Thoughtfully designed, carefully constructed, the *promenade* C1™ is respected around the world for quality and value. The original software controlled programmer does away with personality modules and switches. Intelligent programming capability can cut programming time by 95%! With Disk Software ..... still just $99.50

CAPTURE™

Take control of your '64 or '128* with this easy to use cartridge. Lets you make a back-up disk of your memory-resident software. Your program is then fully accessible to you and your program can be re-booted from your disk 3-5 times faster. Or make an auto-starting cartridge using the *promenade* C1 and a CPR cartridge kit. Its magic!

CAPTURE™ is a bargain at 39.95

CARTRIDGE MATERIALS:

CPR-3 - Three socket board, case and 3 eproms, for use with **CAPTURE™** 29.95
PCC2 - Two 2732 (4K) or 2764 (8K) eproms. For '64 or '128 in 64 mode 4.95
PCC4 - Four sockets for 2764, 27128 or 27256 (32K) eproms. Bank switching 17.95
PCC8 - Like the PCC4 but twice the capacity. For multiple programs 29.95
PRB4 - Four sockets, eprom & battery backed RAM combination 24.95
PTM2 - Basic 128 mode cartridge board. Two 2764 or 27128 eproms ..... 5.95†
PTM4 - Four sockets, 27128 & 27256 eproms. 128 mode bank switcher ..... 19.95†
PCCH2 - Plastic case for above cartridges (except PCC8) 2.25
Eproms - Always in stock at competitive prices.

†available June '86.
*when in 64 mode.

EPROM ERASERS:

Datarase - Hobbyist eprom eraser, 2 at a time, 3 to 10 minutes 34.95
PE14 - Industrial quality eraser, 7 to 9 at a time 79.95
Starter Set - **CAPTURE™**, *promenade* C1 and one CPR3 kit 149.95
Deluxe Set - **CAPTURE™**, *promenade* C1, Datarase and two CPR3 kits 199.95

SHIPPING & HANDLING: USA - UPS SURFACE $3.00 FOREIGN (AIR MAIL ONLY) $13.00

JASON-RANHEIM
1805 INDUSTRIAL DRIVE
AUBURN, CA USA 95603

TO ORDER TOLL FREE 800-421-7731
FROM CALIFORNIA 800-421-7748
TECHNICAL SUPPORT 916-823-3284
FROM OUTSIDE USA 916-823-3285
MC, VISA, AMEX WELCOME

COMPUTER CENTERS OF AMERICA GOES

CHRISTMAS CRAZY

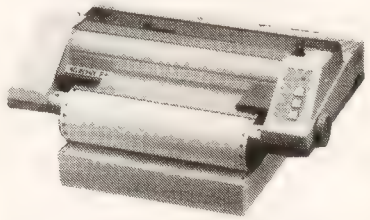
IN N.Y. STATE CALL TOLL FREE
1-800-221-2760

OUT OF STATE CALL
1-800-631-1003

C.ITOH NEVER BEFORE AT THESE PRICES

RITEMAN C+

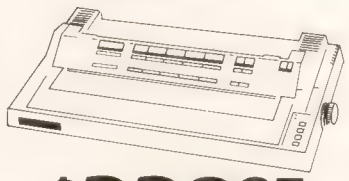
- COMMODORE READY
- FULL GRAPHICS
- NEAR LETTER QUALITY



$159.95

RITEMAN 11

- 10 INCH CARRIAGE
- 160 C.P.S.
- 8K BUFFER
- NEAR LETTER QUALITY
- FULL GRAPHICS



$229.95

ALSO AVAILABLE

RITEMAN 15

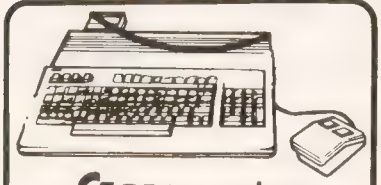
• 15 INCH CARRIAGE • 160 C.P.S. • 8K BUFFER • NEAR LETTER QUALITY • FULL GRAPHICS

$329.95

commodore

1571 DISC DRIVE
$239.95

Paperback Writer 128
Paperback Filer 128
Paperback Planner 128
YOUR CHOICE
$29.95
for the Commodore 128



commodore
128
PERSONAL COMPUTER
$259.95

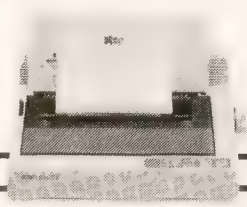
star MICRONICS

NL-10
• DRAFT 120 CPS • NLQ 30 CPS • 5K BUFFER • DOT MATRIX • PLUG-IN INTERFACE CARTRIDGES • STANDARD FRICTION TRACTOR FEED • FULL GRAPHICS
$249.95

NX-10
• DRAFT 120 CPS • NLQ 30 CPS • 5K BUFFER • DOT MATRIX • EASY FRONT PANEL OPERATION • FRICTION & PUSH TRACTOR • PARALLEL INTERFACE • FULL GRAPHICS
$219.95

SB-10
• 24 PIN • DOT MATRIX • DRAFT QUALITY 144 CPS • LETTER QUALITY 54 CPS • FRICTION AND TRACTOR FEED • PARALLEL INTERFACE • PROPORTIONAL CHARACTER SET
$349.95

LV-1210
• 120 CPS • DOT MATRIX • FRICTION AND TRACTOR FEED • NEAR LETTER QUALITY • FULL GRAPHICS
IBM COMPATIBLE 169.95



GEOS™

GRAPHIC ENVIRONMENT OPERATING SYSTEM

• 5 DIFFERENT FONTS • DESK TOP • GEO PAINT • GEO WRITE • DESK ACCESSORIES

NEW FONT - PACK
DESK - PACK
FOR THE COMMODORE 64
CALL FOR PRICE

SP-1000

- Built-in Commodore Interface
- 2-Year Warranty
- Near Letter Quality Mode

$189.95

SEIKOSHA
LIMITED TIME ONLY
SPECIAL INTRODUCTORY PRICE

commodore

64 PACKAGE

INCLUDES:
•Commodore 64 Computer
•Commodore 1541 Disc Drive
• A Color Monitor with Cables

CALL FOR PRICE

•• AUTHORIZED STAR SERVICE CENTER ••

IN N.Y. STATE CALL TOLL FREE
1-800-221-2760
OUT OF STATE CALL
1-800-631-1003

COMPUTER CENTERS OF AMERICA
81 TERMINAL DRIVE
PLAINVIEW, NY 11803

Check, Money Order, MC or VISA accepted. No additional charge for MasterCard and Visa. Call for shipping and handling information / NYS residents add applicable sales tax / Prices and availability are subject to change without notice / All factory fresh merchandise with manufacturer's warranty. Dealers Welcome. Call for recent price reductions and new rebate information. Plus shipping and handling. No returns without return authorization number.

NEW

KRACKER JAX® REVEALED!

THE BOOK

At last—**Kracker Jax** takes you beyond the protection barrier! The secrets of un-protecting software are yours with **Kracker Jax** revealed!

We'll show you exactly,how to defeat five different protection schemes encompassing scores of current programs. Our tutorial has twenty specific examples to lead you, step by step, to a new level of knowledge. Here's what you get:

- **Kracker Jax revealed.**
- **A reset switch.**
- **A utility disk.**
- **20 parameters on disk.**

ONLY $19.95 COMPLETE!

Please add $3.50 shipping & handling.
C.O.D. orders must add $1.50 more.
Please allow two weeks for delivery.

KRACKER JAX®
PROTECTION BUSTERS
BLAST DISK PROTECTION

ARE YOU CAUGHT UP IN THE COPY PROTECTION ARMS RACE?

DEFEND YOURSELF WITH KRACKER JAX® A REVOLUTION IN ARCHIVAL SOFTWARE!

You know the routine by now: you buy an expensive nibbler and next month it's obsolete. How many times is your wallet going to be nibbled?

Kracker Jax is NOT a nibbler. It is a parameter copy system. Most volumes contain well over 100 separate copy parameters. What IS a parameter? Just a custom program that allows your 1541 or 1571 disk drive to strip all, and we mean ALL, copy protection from your expensive software, leaving you with UNPROTECTED, TOTALLY BROKEN back-ups that can be copied with even a simple fast copier.

This system has many advantages over the older nibbler type of utilities. For one thing, you don't have to experiment. Each parameter WILL back-up the title it was created for. Period.

For another, a back-up created with **Kracker Jax** will NEVER rattle your disk drive head. And that means less disk drive alignment problems for you.

Check out some of these exclusive features:

- **Kracker Jax** is the BEST program of its kind!
- **Kracker Jax** will back up titles that the nibblers CAN'T!
- **Kracker Jax** requires NO special knowledge to operate!
- **Kracker Jax** strips protection in a matter of SECONDS!
- **Kracker Jax** is priced RIGHT—just $19.95 complete!
- **Kracker Jax** is UNPROTECTED—easy to back up!
- **Kracker Jax** updates are available QUARTERLY!

Remember, the minute a new program is released, the **Kracker Jax** team will be developing a new parameter for it. This means that future **Kracker Jax** disks will always contain parameters for the hottest new titles on the market! **Kracker Jax** is the system that cannot fall behind the times!

In the copy protection arms race, **Kracker Jax** is the ultimate defense!

ONLY $19.95 COMPLETE! VOL. 1-3 AVAILABLE.
Same day shipping/C.O.D.s please add $3.00.

COMPUTER MART

CHECKS, MONEY ORDERS OR VISA/MASTERCARD ACCEPTED.
Mail your order to: Computer Mart, Dept. G
2700 NE Andresen Road / Vancouver, WA 98661
Phone orders welcome: 206-695-1005
PROGRAM SUBMISSIONS INVITED

VISA MasterCard

COMMODORE 128 OWNERS THE REVISED CLONE ENDS THE SOFTWARE BACK-UP BLUES!

The complete update to the 1571 Clone is now being shipped. Our new manual is almost 50 pages long and explains all aspects. We improved the GCR & Nibble copiers and added a MFM Copy (back up IBM disks on Commodore?). The expansion section has over 50 files. Included is a block editor, auto boot maker, single or 2 side copy, copy to alt. sides, track analysis (sync marks, density, block size, GCR data, Hex data), bulk erase, format, copy & combine files, plus more. Over 25 selections from menus. Use with a 1 or 2 1571 drive system.

STILL ONLY $49.95

Available from
Micro-W. DISTRIBUTING, INC
1342B Route 23
Butler, N.J. 07405
CALL: (201) 838-9027

BACKS-UP MOST EVERYTHING

WE'LL STILL GIVE YOU $10 TRADE IFOR YOUR OBSOLETE COPY DISK

$10 UPGRADE for all registered 1571 CLONE MACHINE Owners
VISA • MASTERCARD
DEALER & DIST INQUIRES

FIFTEEN TIMES THE POWER!

90% + CONFIDENCE LEVEL

Why purchase only 1 thoroughbred handicapping strategy when you can have the POWER of the 15 most popular handicapping strategies available?

A new computer program, designed by an M.B.A. of Finance, combines improved variations of the 15 most popular handicapping strategies into one easy program. This POWERFUL program called Multi-Strats can analyze a race using 15 strategies in a fraction of the time you analyze a race using just 1 strategy.

Simply type in the answers to the program questions. All the info is in the Daily Racing Form. The results of the 15 strategies will automatically appear on your screen or printer. Multi-Strats then tabulates the 15 strategy totals to give you an ultimate number for each horse

When 10 or more strategies select the same horse to win, that horse has over a 90% chance of winning.

Multi-Strats package includes: ★ 15 strategies ★ 50 page booklet ★ 5¼" or 3½" disk or tape ★ telephone hotline number ★ immediate first class delivery ★ BONUS #1 video tutorial (VHS or Beta) ★ BONUS #2 Lottery Program ★ 3 week money back GUARANTEE ★ All for $125

Order by Money Order, Check, Visa, MC, AMEX, or C.O.D. to:
Banana Software, Inc. Dept SA. 6531 Park Avenue, Kent, OH 44240.

ORDERS (216) 673-6969 (24 hrs.) INQUIRIES (216) 673-6167 (recording)

ALL MODELS
COMMODORE IBM APPLE RADIO SHACK ATARI COLECO

FOR COMMODORE 128 AND C-64 OWNERS ONLY:

BLITZ!™

NOW SHOWING AT SKYLES ELECTRIC WORKS

If your programs are slow, BLITZ!™ them

It's Spectacular
Bob has discovered a spectacular compiler for the **Commodore 64** and the **Commodore 128** that he calls ***BLITZ!***

It's Fast
BLITZ! is faster than *PET SPEED*, faster than any other Commodore compiler that has come down the pike. Your ***BLITZ!***-compiled program will run from *five to 20 times* faster than it did before you blitzed it.

It Translates
This disk program translates your slow BASIC programs into a much, much faster code. The ***BLITZ!*** compiler significantly improves the performance of your BASIC routines. It reads the entire program, reduces that program's size by deciding which operations need to only run once, interprets the operations, and then re-writes the program into its own special P-code.

C-64 or C-128

It's a Treasure
Using this compiler, you can now create a string of BASIC programs such that one automatically loads the next. You can also pass information from one program to another. You will find the ***BLITZ!*** compiler a treasured tool in your programming kit.

It's Popular
Reviewers and users have heaped the following praise on the ***BLITZ!***: "The ***BLITZ*** basic compiler is a dream come true for BASIC programmers." Compute!'s Gazette "worth its weight in gold." TPUG "Wonderful" "Fantastic" "I can't imagine programming without it" User comments. It is even more popular with professional programmers. Many commercial programs now say "***BLITZ!***" when they are listed. The ultimate accolade for ***BLITZ!***.

	SALE
***BLITZ!* C-128, Disk**	**69.95***
***BLITZ!* C-64, Disk**	**49.95***

QUICKSILVER 128™ now available for Commodore 128

Is the fastest IEEE-488 Interface available for the **Commodore 128.** How fast? As fast as the external IEEE-488 device will allow. For example, a program or file will load over four times faster from a Commodore 4040 or 8050 disk drive as compared to a 1541 disk drive. ***QUICKSILVER 128*** loads 5 times faster than a serial MSD drive. When used with printers speed is only limited by the printer.

QUICKSILVER 128 is transparent. ***QUICKSILVER 128*** does not occupy any program memory. Almost all programs are completely compatible with ***QUICKSILVER 128.*** A word of caution, some IEEE disk drives have different formats, and 1541 formatted programs are not going to load. Some programs protect the disk by various operations in the 1541 disk memory. These programs will not load on non-1541 disk drives. However, for most uses ***QUICKSILVER 128*** is very quick and transparent.

C-64 or C-128

QUICKSILVER 128 will interconnect your **Commodore 128** to Commodore SFD 1001, 2031, 2040, 3040, 4040, 8050, 8250, 9060, and 9090 Disk Drives. ***QUICKSILVER 128*** will connect your **Commodore 128** to Commodore 2022, 2023, 4022, and 4023 Printers.

QUICKSILVER 128 is easy. Easy to plug into the cartridge port. Easy to plug additional cartridges into the built-in horizontal, cartridge port extender. Easy to locate your IEEE device within 6 feet of ***QUICKSILVER 128*** using the built-in boot IEEE cable. Easy to select which device numbers you want ***QUICKSILVER 128*** to interface to the IEEE bus. Easy to use with almost all programs. Easy to buy, at an amazingly low price, from Skyles Electrics Works or your local dealer.

	SALE
***QUICKSILVER 128*, C-128 Cartridge**	**$119.95**
***IEEE Flash! 64*, C-64 Cartridge**	**99.95**

So many cartridges, so little space . . .

Skyles Electric Works to the rescue, with our 2+1™ and 4+1™ expansion boards for the C-64. Briefly the 2+1 gives you 2 vertical and 1 horizontal fully switchable cartridge ports. The 4+1 continues the tradition with 4 vertical and 1 horizontal cartridge ports. See the inside front cover for more details.

		SUMMER SALE
Skyles 2+1 Expansion Bd. C-64	**$49.95**	**39.95***
Skyles 4+1 Expansion Bd. C-64	**$89.95**	**SUMMER SALE 69.95***

*There is an additional $4.50 U.S. and Canada, $15.00 Europe and Asia, shipping charge per order. California residents add sales tax

Skyles Catalogue Page 3

From Skyles Electric Works, the oldest and largest professionals in the business.

This is just a few of the 200+ bargains from the newest and biggest Skyles catalog, hot off the press.

We know you'll want this page, in its full splendor, and the other pages overflowing with over 200 bargains in peripherals, software, and books that will make your Commodore 128 or C-64 computer even nicer to live with.

So, if we missed sending you your very own copy within the last few weeks, call us at 1-800/227-9998, unless you live in California, in which case call 1-415/965-1735.

Skyles Electric Works
231E South Whisman Road
Mountain View, CA 94041
(415) 965-1735

THE AMAZING VOICE MASTER

SPEECH SYNTHESIS—VOICE RECOGNITION
plus a whole lot more!

Your computer can talk in your own voice. Not a synthesizer but a true digitizer that **records** your natural voice quality—and in any language or accent. Words and phrases can be expanded without limit from disk. Speech Editor program alters or improves sounds.

And it will understand what you say. A real word recognizer for groups of 32 words or phrases with unlimited expansion from disk memory. Speech playback and word recognition can work together. **Have a two way conversation with your computer!**

Easy for the beginning programmer with new BASIC commands. Machine language programs and memory locations for the more experienced software author.

Exciting Music Bonus lets you hum or whistle to write and perform. Notes literally scroll by **as you hum!** Your composition can be edited, saved, and printed out. You don't have to know one note from another in order to write and compose!

Based upon new technologies invented by COVOX. One low price buys you the **complete system** Includes a host of sample programs! In addition, you will receive periodic information about speech technology, applications, new products, up-dates, and user contributions. **You will never find a better value for your computer.**

ONLY $89.95 includes all hardware and software.

Available from your dealer or by mail. When ordering by mail add $4.00 shipping and handling ($10.00 foreign, $6.00 Canada).

The Voice Master is available for the Commodore 64, 128, Apple IIc, IIe, II+, and Atari 800, 800XL, 130XE. Specify model when ordering. Apple II+ (with 64K) owners must have joystick adapter. Available from Covox at only $9.95.

Apple IIe and II+ owners: Enhance speech quality and music capabilities with optional Sound Master hardware card. Installs in slot 4 or 5. Available separately for $39.95 with demo software, or order with Voice Master for only $119.95 (saves $10 when ordered together).

DEMO SPEECH DISK AVAILABLE New! An introduction to Covox speech. The $5 disk gives several general vocabularies that you can use in any of your own programs. Sample programs include a talking keyboard, calculator, clock, and more. English, French and German selections. Samples of level 1 and 2 speech editing. 28 page booklet included. Price is $5 including postage ($7 outside North America). Check, money order, or cash only. SPECIFY COMPUTER BRAND.

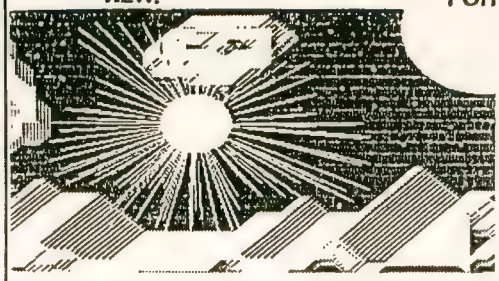
For telephone demo, additional information, or prompt service for credit card orders (except $5 talking disk),

VISA **CALL (503) 342-1271** MasterCard

Call or write today for complete product information.

COVOX INC. (503) 342-1271
675-D Conger Street, Eugene, OR 97402
Telex 706017 (AV ALARM UD)

NEW! FOR THE C-128!



PRESENTING . . .
A NEW GRAPHIC-ART
DISCOVERY FOR THE
C-128 COMPUTER!

3-D CANVAS

Features NEVER-BEFORE POSSIBLE! Throw away "wire-frame" 3-D Progs.
NOW! DRAW TRUE 3-D IMAGES AS EASY AS MOVING A JOYSTICK -
IN ANY SIZE, EVEN DRAW IN TRANSPARENT 3-D!
2-D DRAWING,TOO, IN ANY BRUSH SIZE.
CHANGE Colors, ANGLES, Size at TOUCH OF A KEY!
CREATE Complex 3-D Screens in seconds and SAVE them on DISK or
DUMP A HARD-COPY TO PRINTER!
PRINT TEXT Anywhere on Screen in 16 Colors!
Make CIRCLES, SPHERES, POLYGONS, BOXES, Etc. -
FILL with COLORS or PATTERNS!
DUPLICATE, STRETCH, TRANSFER, INVERT or
EVEN ANIMATE ANY Block of DRAWING!
ADD SPRITE ANIMATION for LIVING DRAWINGS!

MULTICOLOR MODE: To transfer your Drawings into MULTICOLOR.

ALL THIS & MORE AT LOW INTROD. PRICE:
only **$49.95** U.S. (Ca.Res. Add 6%)

CAPPCO - P.O. Box 7652
Chula Vista, Calif. 92012-7652
Tel: (619) 477-5970

OTHER C-128 PROGS. AVAILABLE:
FANTASTIC GALAXY - FAST-ACTION ARCADE GAME IN NEW DIMENSION! $24.95
C-128 UTILITY DISK - GAMES, DEMOS, USEFUL UTILS, FOR THE 128! $14.95

NEW VERSION 3.0 FOR C64 & C128 IN 128 MODE.

MIRROR

THE

THE MIRROR

MIRROR

DISK COPIER

$24.95

NO FINER OR MORE ADVANCED ARCHIVAL COPIER AVAILABLE AT ANY PRICE.
EASY TO USE. DOES NOT CAUSE DRIVE HEAD TO KNOCK.
COPIES UP TO 41 TRACKS.
PERIODIC UPDATE POLICY.
AUTOMATICALLY MAKES BACK-UP COPIES FROM VIRTUALLY ALL PROTECTED SOFTWARE.
NIBBLES, HALF TRACKS, COPIES EXTRA SECTORS AND EXTRA TRACKS.
REPRODUCES ALL DISK ERRORS AUTOMATICALLY.
FAST, COPIES FULL DISK IN AS LITTLE AS 4-7 MINS. EVEN COPIES ITSELF.

WE COPY MORE!
MASTERCARD, VISA, M.O. OR CHECK OK
+ $3 SHIPPING & HANDLING
C.O.D. OR FOREIGN ORDERS ADD $2
CALIF. ORDERS ADD 6% SALES TAX
— WRITE OR CALL —

Compumed
(408) 758-2436
P.O. BOX 6939
SALINAS, CA 93912
FOR COMMODORE 64 AND 1541 DRIVE
OR COMMODORE 128 AND 1571 DRIVE

VISA

Software Discounters of America

S.D. of A.

For Orders Only—1-800-225-7638
PA Orders—1-800-223-7784
Customer Service 412-361-5291

- Free shipping on orders over $100 in continental USA
- No surcharge for VISA/MasterCard
- Your card is not charged until we ship

ABACUS BOOKS
C128 Internals CALL
C128 Tricks & Tips FOR
CAD 128 PRICES
CPM 128 User's Guide
1571 Internals
ABACUS SOFTWARE
Basic 128
Cad Pak 64
Cad Pak 128
Chart Pak 128
Cobol 64
Personal Portfolio Mgr. 64
Power Plan 64
Speed Term 128 CALL
Super C 128 FOR
Super Pascal 64 PRICES
ACCESS
Executive Leader Board Data Disk $14
Leader Board Golf (D) $25
Leader Board Tourn. Disk #1 .... $14
Mach 128 (R) $33
Tenth Frame (D) $25
ACTIVISION
Alter Ego (Male or Female) $33
Gamemaker Library Disks:
Sports $14
Sci Fi $14
Garry Kitchen's Gamemaker (D) ... $25
Hacker 2 (D) $23
Little Computer People (D) $23
Music Studio (D) $23
Murder on the Mississippi (D) ... $23
Tass Times in Tonetown (D) $23
ACCOLADE
Ace of Aces (D) $19
Dambusters (D) $19
Fight Night (D) $19
Hard Ball (D) $19
PSI-5 Trading Co. (D) .$19
AMERICAN EDUCATIONAL
Biology (D) $12
French (D) $12
Grammar (D) $12
Science: Grades 3/4(D) $12
Science: Grades 5/6(D) $12
Science: Grades 7/8(D) $12
Spanish (D) $12
U.S. Geography (D) $12
World Geography (D) $12
World History (D) $12
ARTWORX
Beach Blanket Volleyball (D) $12
Bridge 4.0 (D) $16
Equestrian Show Jumper (D) $12
Strip Poker (D) $21
Data Disk #1 female .$16
Data Disk #2 male ... $16
Data Disk #3 female .$16
ARTWORX PX
Hole In One Golf (D) ..$7
Pro Boxing (D) $7
AVALON HILL
Super Bowl Sunday (D) $21
SBS 1984 Team Disk .$14
SBS 1985 Team Disk .$14
SBS Champs Disk ... $14
Spitfire '40 (D) $23
Title Bout (D) $19
Tournament Golf (D) .$19
AVANTAGE
Desert Fox (D) $12
Deceptor (D) $12
Spy vs. Spy 1 & 2 .... $12
BATTERIES INCLUDED
Consultant (64 or128) $39
Paperclip w/Spell 64 or 128 ..... $49
Paperclip II 128 ... $49
BERKELEY SOFTWORKS
Geos 128 ..... Call
Geos 64 (D) $39
*Geos Desk Pak (D) .$23
*Geos Font Pak (D) .. $19
***Geos add-on programs only!**
BRODERBUND
Bank St. Writer (D) .. $33
Carmen Sandiego (D) $23
Print Shop (D) $26
P.S. Companion (D) .. $23
P.S. Graphics Library #1, #2, or #3 .. $16 Ea.
P.S. Graphics Library Holiday Edition ... $16
Toy Shop (D) $39
Type! (D) $25
CBS
Argos Expedition (D) .$7
Big Bird Spc. Del. (R) $7
Dream House (D) $7
Ernie's Big Splash (D) .$9
Ernie's Magic Shapes (R) $7
Grover's Animal Adventures (D) $9
Mastering the SAT (D) .$44
Math Mileage (D) $7
Movie Musical Madness (D) $7
Railroad Works (D) ... $7
Rich Scarry's Electronic Word Book (D) $12
Sesame St. Pals Around Town (D) ... $9
Success w/Algebra .Call
Success w/Math ... Call
Timebound (D) $7
Weather Tamers (D) .. $7
CDA
America Cooks Series:
American (D) ... $9.95
Chinese (D) $9.95
French (D) $9.95
Italian (D) $9.95
Mexican (D) $9.95
CMS
General Acct. 128 .. $119
DATA EAST
Commando (D) $23
Karate Champ (D) $23
Kung Fu Master (D) .. $23
Tag Team Wrestling(D) $23
DAVIDSON
Math Blaster (D) $33
Spell It (D) $33
Word Attack (D) $33
DIGITAL SOLUTIONS
Pocket Filer 128
Pocket Planner 128
Pocket Writer 128
*Your choice .$29.95 Ea.
ELECTRONIC ARTS
Software Classic Series:
Archon (D) .. $9.88
Cut & Paste W.P. (D) .$9.88
Heart of Africa (D) $9.88
Mail Order Monsters (D) $9.88
M.U.L.E. (D) $9.88
Music Const. Set (D) .$9.88
One-on-One (D) $9.88
Pinball Const. Set (D) $9.88
Racing Dest. Set (D) $9.88
Realm of Impossibility (D) .$9.88
Seven Cities Gold(D) $9.88
Super Boulder Dash (D) $9.88
Touchdown Football(D) $9.88
ELECTRONIC ARTS
Adv. Const. Set (D) .. $26
Archon 2: Adept (D) .. $23
Arctic Fox (D) $23
Bard's Tale 1 (D) $26
Bard's Tale 2: The Destiny Knight (D) . $26
Battlefront (D) $26
Carriers at War (D) .. $32
Chessmaster 2000 (D) $26
Europe Ablaze (D) ... $32
Lords of Conquest (D) .$23
Make Your Own Murder Party (D) .. $23
Marble Madness (D) .$23
Movie Maker (D) ... $23
Robot Rascals (D) ... $26
Skyfox (D) $23
Timothy Leary's Mind Mirror (D) ... $23
Ultimate Wizard (D) .. $19
ELECTRIC DREAMS
Rocky Horror Show (D) $19
Spindizzy (D) $19
Zoids (D) $19
EPYX
Barbie (D) $9
Champ. Wrestling (D) .$19
Destroyer (D) ..... Call
Fast Load (R) $23
Impossible Mission (D) .$9
Movie Monster (D) ... $23
Multiplan 128 ..... $39
Pitstop II (D) $9
Summer Games 2 (D) $23
Super Cycle (D) .. $23
Temple of Apshai Trilogy (D) $23
Winter Games (D) . $23
World Championship Karate (D) $17.95
World Games (D) $23
FIREBIRD
Elite (D) $19
The Pawn (D) .. .$29
FISHER PRICE
Alpha Build (R) $7
Dance Fantasy (R) ... $7
Hop Along Counting (R) $7
Linking Logic (R) $7
Memory Manor (R) ... $7
Number Tumbler (R) .. $7
Sea Speller (R) $7
GAMESTAR
Championship Baseball '86 ..... $23
Champ. Basketball (D) $23
Star Rank Boxing (D) $19
HES
Microsoft Multiplan (D) $19
Millionaire (D) $12
Project Space Station (D) $19
HI-TECH EXPRESSIONS
Card Ware (D) $7
Heart Ware (D) $7
Party Ware (D) $12
Ware w/all Supply Kit $12
INFOCOM
A Mind Forever Voyaging 128 .$25
Ballyhoo (D) .. $25
Cut Throats (D) $23
Enchanter (D) $23
Hitchhiker's Guide to the Galaxy (D) $23
Infidel (D) $25
Leather Goddesses (D) $25
Moonmist (D) $25
Planetfall (D) .. . $23
Sorcerer (D) $25
Suspect (D) . $25
Trinity 128 .... $25
Wishbringer (D) $23
Zork 1 (D) $23
Zork 2 or 3 (D) $25
INTRACORP
Intracourse (Compatibility & Analysis Modules) $65
Intracourse (Compatibility Module) $33
Intracourse (Analysis Module) $39
MASTERTRONIC
Action Biker (D) $7
Electra Glide (D) $7
Infinity Machine (R) .$12
5-A-Side Soccer (D) ... $7
Kikstart 128 ..... $12
Knight Games (D) $7
Last V-8 (D) $7
Last V8 128 ..... $12
Master of Magic (D) .. $7
Marauder (D) ..... Call
Ninja (D) $7
Pro Golf (D) $7
Speed King (D) $7
Street Surfer ..... Call
The Slugger (D) $7
Vegas Poker & Jackpot (D) $7
MICROLEAGUE
Baseball (D) $25
Box Score Stats (D) .. $16
General Manager (D) $25
1985 Team Data Disk $14
MICROPROSE
Gunship (D) ... $23
Silent Service (D) .$23
MINDSCAPE
Bop & Wrestle (D) ... $19
Color Me: The Computer Coloring Kit (D) ... $19
Fairlight (D) $19
Great British Software (D) .. $12
Indoor Sports (D) $19
Infiltrator (D) $19
Perfect Score SAT .. $44
Spell of Destruction .$19
The American Challenge Sailing Simulation $19
MISC
CSM 1541 Align Kit (D) . .$29
Central Point-Copy 2 (D) $23
Gato (D) $19
Snapshot 64 (R) $39
Superbase 64 (D) $47
Superbase 128 (D) ... $59
Superscript 64 (D) ... $47
Superscript 128 ..... $47
ORIGIN
Autoduel (D) $32
Moebius (D) $26
Ogre (D) $26
Ultima 3 (D) $32
Ultima 4 (D) $39
PENGUIN/POLARWARE
Crimson Crown (D) .. $12
Graphics Magician Painter (D) $16
Oo-Topos (D) $12
Transylvania (D) $12
PROFESSIONAL SOFTWARE
Fleet System 2—W.P w/70,000 word spell checker 64 or 128 .$39
Fleet System 3 (128) .$49
RELEVANT
Billboard Maker (D) .$25
Icon Factory (D) $25
SCARBOROUGH
Boston Computer Diet (D) $23
Build A Book (D) .$16
Mastertype (D) .. $25
Net Worth (D) .. $39
SPINNAKER
ACE: Air Combat Emulator (D) ... $14
Alf in Color Cave (R) .$7
Bubble Busters (R) ... $7
Cosmic Combat (R) .. $7
Gold Record Race (R) .$7
Letter Scrambler (R) .. $7
Ranch (R) $7
Story Machine (R) $7
SPRINGBOARD
Certificate Maker (D) $33
Newsroom (D) $33
N.R. Clip Art Vol. 1 (D) $19
N.R. Clip Art Vol. 2 (D) $25
N.R. Clip Art Vol. 3 (D) .Call
Print Shop Graphics Expander (D) $23
SSI
Battle Group (D) $37
Battle of Antietam(D) $33
Colonial Conquest (D) $25
Gemstone Warrior (D) $23
Gettysburg (D) $37
Kampfgruppe (D) $37
Mech Brigade (D) ... $37
NAM (D) $25
Phantasie (D) $25
Phantasie 2 (D) $25
Rings of Zilfin (D) ... $25
Roadwar 2000 (D) ... $25
Shard of Spring (D) .. $25
Wizard's Crown (D) .. $25
SUBLOGIC
Baseball (D) $32
Flight Simulator 2 (D) .$32
F.S. Scenery Disks .. Call
Football (D) $26
Jet (D) $26
TELARIUM
Amazon (D) $9
Fahrenheit 451 (D) ... $9
Dragon World (D) $9
TIMEWORKS
Accts. Payable (D) .. $39
Accts. Receivable (D) $39
Data Manager 2 (D) .$25
Data Manager 128 ... $43
Evelyn Wood Dynamic Reader (D) $25
General Ledger (D) .. $39
Inventory Mgmt (D) .. $39
Partner 64 (R) $39
Partner 128 (R) $43
Swiftcalc/Sideways(D) $25
Swiftcalc/ Sideways 128 .... $43
Sylvia Porter's Personal Fin. Planner(D) 64 .. $33
Sylvia Porter's Personal Financial Planner 128 ..... $43
Word Writer w/ Speller (D) $33
Word Writer w/85000 Word Speller (128) .$43
UNISON WORLD
Art Gallery 1 (D) $16
Art Gallery 2 (D) $16
Print Master (D) $23
WEEKLY READER
Stickybear ABC'S (D) $16
Stickybear Math (D) .$16
Stickybear Numbers(D) $16
Stickybear Reading (D) $16
Stickybear Shapes (D) .$16
WINDHAM CLASSICS
Alice in Wonderland (D) $9
Below the Root (D) $9
Swiss Family Robinson (D) $9
Treasure Island (D) $9
Wizard of Oz (D) $9
ACCESSORIES
Anchor 6420 300 Baud Modem .$49
Anchor 6480 300/1200 Baud Modem w/Software $129
Bonus SS, DD .. $5.99 Bx
Bonus DS, DD .. $6.99 Bx
Bulk Disks ..... Call
Compuserve Starter Kit (a $25 usage Credit) .$19
Disk Case (Holds 50) .$9
Disk Drive Cleaner ... $9
Dow Jones Membership Kit (5 hrs.) $14
Epyx 500XJ Joystick .$14
Kraft Joystick $9
Magnum Joystick ... $12
Muppet Learning Keys Call
Seikosha SP1000VC 100 CPS Commodore direct-connect dot matrix printer $179
Wico Bat Handle $17
Wico Black Max $9
Wico Boss $12
Wico Three-Way $21

P.O. BOX 111327—DEPT. CG—BLAWNOX, PA 15238

***Please Read The Following Ordering Terms & Conditions Carefully Before Placing Your Order:** Orders with cashiers check or money order shipped immediately. Personal & Company checks, allow 3 weeks clearance. No C.O.D.'s. **Shipping: Continental U.S.A.**—Orders under $100 add $3; **free shipping on orders over $100. AK, HI, FPO, APO—add $5 on all orders. Canada & Puerto Rico—add $10 on all orders.** Sorry, no other International orders accepted! **PA residents add 6% sales tax on the total amount of order including shipping charges!** Prices subject to change without notice. **REASONS FOR CALLING CUSTOMER SERVICE—412-361-5291 (1)** Status of order or back order **(2)** If any merchandise purchased within 60 days from S.D. of A. is defective, please call for a return authorization number. Defective merchandise will be replaced with the same merchandise only. NO CREDITS! After 60 days please refer to the manufacturers warranty included with the merchandise & return directly to the manufacturer. **Customer service will not accept collect calls or calls on S.D. OF A.'s 800# order lines! REGULAR HOURS: Mon.-Fri. 9AM-5:30PM, Sat. 10AM-4PM Eastern Time. CHRISTMAS HOURS: Nov. 1-Dec. 16: Mon. & Fri. 9AM-5:30 PM, Tues., Wed. & Thurs. 9AM-8PM, Sat. 10AM-4PM Eastern Time. Customer Service Closed Saturday & Evenings. ORDERS RECEIVED AFTER DECEMBER 16th WILL NOT BE GUARANTEED FOR CHRISTMAS DELIVERY!**

COMB

Authorized Liquidator

Commodore Compatible Total Telecommunications™

MODEM

FCC Approved

- **Access the stock market, take college classes, do your shopping and more.**
- **For Commodore 64K or SX64.**
- **Has modular jacks for quick, easy hookup to your phone system!**
- **Works on TouchTone™ and Rotary (pulse) dialing (not PBX).**

Overstock liquidation. Simple communications package connects 64K or SX64 for on-line telephone use. No special computer knowledge required. This super-intelligent software is completely menu-driven and easy to understand.

Features: 30K software buffer. 300 Baud. Auto-dial simplifies complex modem steps. Upload, download of text, programs, data files. Captures and displays hi-resolution, mapped graphics files. Color selection menu. **Equipment needed:** C64, monitor, and disk drive or SX64.

NOTE: Price includes trial subscription to over 52 data base services for vast information. Initial sign-up fee is FREE. All you pay is the on-line time you use, plus monthly rate.

90-Day Limited Factory Warranty.

Mfr. List: $109.95

Liquidation Priced At $19

Item H-1763-3646-007 Ship, handling: $4.00

Credit card customers can order by phone, 24 hours a day, 7 days a week. VISA MasterCard AMERICAN EXPRESS

Toll-Free: 1-800-328-0609

Sales outside the 48 contiguous states are subject to special conditions. Please call or write to inquire.

C.O.M.B. Direct Marketing Corp. Item H-1763
1405 Xenium Lane N/Minneapolis, MN 55441-4494

Send ___ **Modem(s)** Item H-1763-3646-007 at $19 each plus $4 each for shipping, handling. (Minnesota residents add 6% sales tax. Sorry, no C.O.D. orders.)

☐ My check or money order is enclosed. (No delays in processing orders paid by check.)

Charge: ☐ VISA® ☐ MasterCard® ☐ American Express®

Acct. No. _____ Exp. ___/___

PLEASE PRINT CLEARLY

Name _____

Address _____

City _____

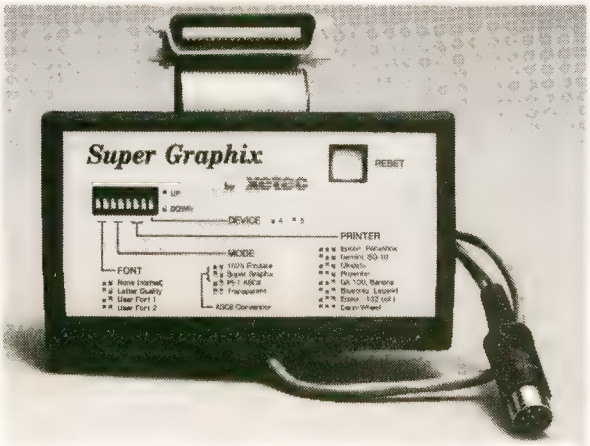
State _____ ZIP _____

Phone (___) _____

Sign Here _____

COMB Direct Marketing Corp.
Authorized Liquidator
1405 Xenium Lane North
Minneapolis, Minnesota 55441-4494

Super Graphix



Includes: Utility Disk With 27 Fonts And Font Creator

GRAPHICS and FONTS plus an 8K BUFFER for the ultimate in performance and speed. The XETEC Super Graphix interface for Commodore Computers now offers a new high in technology with these features:

- 8K Buffer Standard
- 10 Printing Modes
- 3 Internal Screen Dumps
- Extensive Command Channel
- Reset Button to Halt Printing from Buffer
- Switch Settings on Label for Quick Reference
- Correspondence Quality Font Built-In
- Capable of Storing 2 Additional Fonts
- Correct Graphics/Text Aspect Ratio for all Major Printers
- 8 Active Switches with Changes Constantly Monitored
- Internal Fonts Support Super-script, Sub-script, Underlining, Bold-face and Choice of 9 Pitches

Suggested list $99.95 • ***Includes Lifetime Warranty***

XETEC, Inc. / 2804 Arnold Rd. / Salina, KS 67401 / 913-827-0685

COMMODORE BRAND SOFTWARE

FOR THE 64 AND 128 COMPUTERS BELOW ORIGINAL WHOLESALE

PROGRAMMING AIDS	
Assembler	$15
Super Expander (C)	12
Pilot	14
Screen Editor	12

EDUCATION & LEARNING	
A Bee C's (C)	$6
EZ Match/EZ Count	6
Whats Next	6
Fishmetic	6

INFOCOM MIND GAMES	
Zork II	$11
Zork III	11
Suspended	11
Starcross	11
Deadline	11

VIDEO ARCADE	
Kickman (C)	$5
Clowns (C)	5
Visible Solar System (C)	6
Tooth Invaders (C)	6
Blue Print (C)	6
Solar Fox (C)	8
Star Rangers (C)	8
Viduzzles (C)	8
Satan's Hollow	10
Triad	9
Chess	10
Rally Speedway	10

NOTE: ALL SOFTWARE IS ON DISK EXCEPT WHERE NOTED WITH A (C) WHICH IS ON CARTRIDGE.

PUBLIC DOMAIN	
Business	$3
English I	3
English II	3
English III	3
English IV	3
English V	3
English VI	3
English VII	3
Math I	3
Math II	3
Math III	3
Math IV	3
Math V	3
Math VI	3
Math VII	3
Math VIII	3
Science I	3
Science II	3
Science III	3
Science IV	3
Technology	3
History	3
Games III	3

ORDERING INFORMATION: For fast delivery send cashiers check or money order. Personal checks allow 3 weeks to clear. COD charges $3.00. Please add 5% for shipping and handling with a $3.00 minimum. Florida residents please include 5% sales tax. All goods are new and factory sealed. All sales are final.

S & R MARKETING
P.O. BOX 9597
CORAL SPRINGS, FL 33075-9597

TO ORDER CALL TOLL FREE
1-800-523-4874
IN FL CALL 305-685-5423
BETWEEN 9 a.m. - 4 p.m. E.T. MONDAY - FRIDAY

DISCOUNT SOFTWARE

INTRODUCING

NINTENDO ENTERTAINMENT SYSTEM

DELUXE SET — Includes Control Deck, 2 Controllers, R.O.B. (Video Robot), Zapper (Light Gun), 2 Game Paks - Gyromite & Duck Hunt $139.00

CONTROL DECK — Includes Control Deck, 2 Controllers, Super Mario Bros. Game Pak $89.00

ACCESSORIES

R.O.B. (Video Robot) $42.00
Zapper (Light Gun) $24.00

GAME PAKS

Robot Series . . . . . ea. $32.00
Light Gun Series . . . . . ea. $28.00
Programmable Series . . ea. $28.00
Sports Series . . . . . ea. $24.00
Action Series . . . . . ea. $24.00
Education Series . . . . . ea. $19.00
Arcade Classics . . . . . ea. $19.00

WORLDS OF WONDER LAZER TAG

LAZER TAG GAME KIT — Includes Star Lyte (Hand Unit), Star Belt & Star Sensor $45.00

ACCESSORIES

Lazer Tag Star Vest $18.00
Lazer Tag Star Sensor $20.00
Lazer Tag Star Band . . . . . $ 9.00
Lazer Tag Star Helmet $36.00
Lazer Tag Star Cap $20.00

ANIMATED TALKING TOYS

Teddy Ruxpin $65.00
Grubby $49.00
Mother Goose $65.00
Snoopy $75.00
Charlie Brown $49.00
Woodstock . . . . . CALL
Poseable Miniatures . . . . . as low as $ 2.50

ACCESSORIES

Hand Puppets . . . . . as low as $12.00
Books & Tapes . . . . . as low as $ 9.75
Clothing (for talking toys) . . . . . as low as $10.50

TOP HITS

AMIGA SOFTWARE

Leader Board Golf . . . . . $ 29
Little Computer People . . $ 29
Music Studio . . . . . $ 29
Deluxe Paint . . . . . $ 72
Art Disk Vol. I . . . . . $ 24
Deluxe Print . . . . . $ 72
Art Disk Vol. II . . . . . $ 24
Deluxe Video . . . . . $ 72
Instant Music . . . . . $ 39
Marble Madness . . . . . $ 32
Winter Games . . . . . $ 32
Hitchhiker's Guide To The Galaxy . . . . . $ 32
Lattice C Compiler $119
A-Copier . . . . . $ 32
Silent Service . . . . . $ 32
3-D Graphics Library . . . . $ 39
VIP Professional $159
Marauder . . . . . $ 32
Grabbit . . . . . $ 24
Amiga Macro Assembler . $ 79
Amiga Pascal . . . . . $ 79
Amiga LISP $159
Aegis Animator $109
Aegis Draw $159
Typing Tutor/Word Invaders . . . . . $ 27

HARDWARE

256K Color Amiga System . . . . . CALL
256K Amiga . . . . . CALL
A1010 3½" Disk Drive . . CALL
A1080 Color Monitor . . . CALL
A1050 256K Expansion . . CALL

C64/128 SOFTWARE

All ABACUS Titles . . . . . CALL
All MASTERTRONICS Titles . . . . . CALL
World Karate Championship $29
Winter Games $26
The Toy Shop $45
Gettysburg: The Turning Point $45
10th Frame $29
World Games $29
Road War 2000 . . . . . $29
Gemstone Healer $29
Destroyer $29
Shard of Spring $29
Hardball $25
Commando $25
Gunship $25
Fontmaster II $32
GEOS $49
F-15 Strike Eagle $25
Fast Hack'em $29
Merlin 64/128 . . . . . $39
Copy II 64/128 . . . . . $39
Newsroom $39
Print Shop $35
Print Shop Companion $28
Print Master $27

HARDWARE

D 64 C Computer . . . . . CALL
D 1541 C Disk Drive . . . . CALL
C-128 Computer . . . . . CALL
VIC-1571 Disk Drive . . . . CALL
VIC-1581 Disk Drive . . . . CALL

RIBBONS

Commodore - 1525 . . . . $ 7.50
Commodore - 1526/802 $ 7.00
Commodore - MPS-801 $ 7.50
Commodore - MPS-803 $ 9.00
Epson MX/RX/FX - 80 . . $ 5.00
Okimate 10 - Color . . . . $ 6.00
Star Powertype . . . . . $ 6.00
SG-10 Black . . . . . $ 2.50
SG-10 Color - Please State Choice of Color . . . . $ 3.50

DUST COVERS

Amiga System Pack . . . $29.00
Amiga 1010 Disk Drive . $ 8.00
C-128 Computer . . . . . $ 8.00
1541 Disk Drive . . . . . $ 7.00
1571 Disk Drive . . . . . $ 8.00
1702 Monitor $10.00
VIC 20/64 Computer . . . $ 7.00

PRINTERS

Others Available - Please Call

Star Micronics LV-1210 . . $179
Star Micronics NL-10 . . . . $229
Star Micronics NX-10 . . . . $239
Star Micronics SG-10C . . $229
Star Micronics SG-15 . . . . $369
Star Micronics SR-15 . . . . $599
Epson - FX-85 . . . . . $399
Panasonic - 1091 . . . . . $259

CALL ON THESE AND OTHER PRODUCTS. WE CARRY A COMPLETE LINE OF SOFTWARE AND HARDWARE

CHRISTMAS SPECIALS

MINDSCAPE

(Educational - Age 4 to 8)

Tink's Adventure $6.95
Tuk Goes to Town $6.95
Tinka's Mazes $6.95
Tonk in the Land of The Buddy Bots $6.95

(Age 8 to 12)

Mr. Pixel's Paint Set $9.95
Mr. Pixel's Cartoon Kit . . $9.95
Show Director $9.95

DATASOFT

O'Riley Mine $5.95
Dallas Quest $5.95
Mancopter $5.95

TIMEWORKS

Money Manager (D&C) . . $5.95
Electronic Checkbook (D&C) $5.95
Data Manager (D&C) . . . $5.95

COMMODORE

Suspended . . . . . $ 9.00
Star Ranger . . . . . $ 3.00
Music Composer . . . . . $ 3.00
English III . . . . . $ 1.50
English V . . . . . $ 1.50
English VII . . . . . $ 1.50
Math V . . . . . $ 1.50
Accounts Payable $10.00
Payroll/Check Writing $10.00

ALL TITLES ON DISK UNLESS MARKED (R) FOR ROM CARTRIDGE

Order Line
1-800-282-0333
ORDERS ONLY! Sales Personnel Do Not Have Information on Previous Orders or Product Specs.

WE CHECK FOR STOLEN VISA & MASTERCARD
M-F 10 a.m.-8 p.m.; Sat. 10-3 ET
37 S. Broad Street, Fairborn, OH 45324

Customer Service & Ohio Residents
1-513-879-9699

AD #G-126

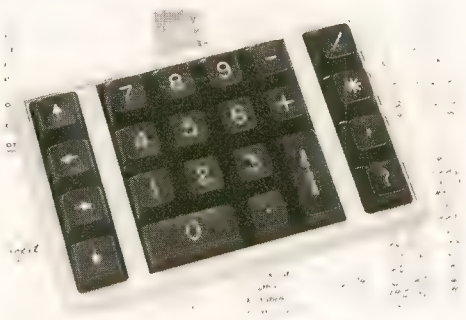
VISA

SOFTWARE ONLY — Prepaid orders over $50 receive free shipping via UPS in continental U.S. Please add $2 orders under $50. HARDWARE and all orders requiring shipment via U.S. Post Office are subject to additional freight charges. Add $5 for COD orders. VISA/MasterCard orders add $2 service charge. Ohio residents add 5.5% sales tax. Personal checks require a three-week waiting period. No waiting when paid by credit card, certified check or money order. All items subject to availability and price change. PLEASE CITE AD NUMBER WHEN ORDERING. ALL RETURNS MUST BE ACCOMPANIED BY AN AUTHORIZATION NUMBER.

MasterCard

You Have a Choice.

Numeric Keypads



CP Numeric Keypad, Deluxe Model

- Top quality, low profile key switches for smooth, reliable data entry.
- Easily connected with computer keyboard.
- No software is required. 100% Compatible with all programs.
- Available for Commodore 64, SX-64*, VIC-20 and Apple IIe Computers.
- One year warranty and available in three models:

Regular $49 95

Plus $59 95

Deluxe $69 95

Power Supply

- Has better features than the original one at $39.95.
- Is serviceable, NOT disposable.
- Works dependably with one year warranty.
- For Commodore and Atari* Computers.

Computer Place (213) 325-4754

23914 Crenshaw Blvd. Torrance, CA 90505

* Requires adaptor at additional cost. VISA, MC & AE accepted. No C.O.D. Add $3.00 shipping. CA residents add 6.5% sales tax. Dealer inquiries welcome

Commodore 64, SX-64 and VIC-20 are trademarks of Commodore Business Machines, Inc. Atari is the trademark of Atari Corp., Apple IIe is the trademark of Apple Computer, Inc.

C-64™ • VIC™ • SX-64™ • C-128™ • Plus 4™ • C-16™ • B-128™ • PET™ • CBM™ • LCD™

One disk, 25 business programs, $19.95

The **Intelligent Software Package** is the one product for your Commodore that can take care of all your data processing needs.

Customers write: *". . . accolades for the authors. This is as slick a deal as I have seen and more than adequate for all except fancy presentations. The best thing is the ease of use . . ."*

"I have come to consider these programs among the most valuable pieces of software I own."

There are no hidden fees for shipping or documentation, and no clubs to join. The package is not public domain software, and is sold only direct to customers by mail: it supports all available printers, and will run on any Commodore computer (except Amiga) with a minimum of 10k RAM, including the C-128 in C-128 mode.

What you get when you order the Package:

Database—A complete database manager. All fields completely user-definable. Can be used for any number of tasks, including accounting, checkbook and tax records, mailing lists, inventory control, catalog maintenance, or as an electronic rolodex. A customer writes: *"I am especially impressed with Database, and have used it to replace a half-dozen other 'database'-type programs I had been using."*

Word Processor—A full-featured menu-driven word processor. Allows full control over margins, spacing, paging, indentation, and justification. *"Highly recommended."*—Midnite Software Gazette. *"Provides good basic features."*—Compute's Gazette.

Copycalc—An electronic spreadsheet. *"Excellent program for budgeting, estimating, or any math-oriented use . . . well worth the money. Highly recommended."*—Midnite Software Gazette.

ReportGen—creates form letters, mailing lables, etc.

ReportMerge—creates statements invoices.

Baseball Stats—compiles team batting statistics.

Index—indexes W/P's text files.

Wordcount—counts words in a text file.

WPConvert—converts files to other WP formats.

DBMerge—facilitates relational D/B applications.

DBStat, DBStat2—analyze D/B files.

ASCII—converts text files into program files.

Checkbook—reconciles checkbook.

Inventory—Maintains inventory records.

Paper Route—A/R for paper route.

Loan Analysis—computes finance terms, prints schedules.

Breakeven—computes breakeven analysis.

Depreciation—creates depreciation schedules.

Labeler—creates labels.

File Copier—copies sequential, program files.

Correlation—calculates statistical correlation.

Also other Database and Word Processor utilities.

To order, send name, address, and $19.95 to address below. Please specify regular (1541/1571/2040/4040/2031) disk, 8050 disk, or cassette (cassette not available for Plus 4 or C-16). Add $3 for credit card or COD orders; Calif. residents add 6%. No personal checks from outside USA. A sampling of program output is available for $1. **Tear this ad out and keep it handy!**

Intelligent Software
Quality Software since 1982

Box A Dept. G-9
San Anselmo, CA 94960
(415) 457-6153

DISK-OF-THE-MONTH CLUB

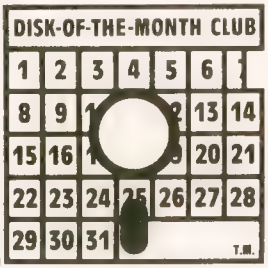
P.O. BOX 116, FAIR LAWN, N.J. 07410-0116

NAME

STREET ADDRESS

CITY STATE ZIP

Div. of UNLIMITED SOFTWARE INC



CLOCK/CALENDAR

Cartridge for your Commodore 64 or 128 Computer

Combines three most needed functions in a single plug-in cartridge:

- ★ Battery-Backed Clock/Calendar
- ★ Battery-Backed RAM
- ★ Application ROM Capability

Features:

- Crystal controlled clock keeps time in seconds, minutes, hours, day of the week, month and year with auto leap year.
- 8K bytes of battery-backed RAM included.
- Application ROM socket handles up to 128K bytes of application software in EPROM.
- Operating software in ROM included.
- Automatic recognition of computer type (64 or 128) on power-up or reset.
- Maintains power-off, power-on log in RAM for dedicated control applications.
- 30 day unconditional money-back guarantee.

CCSZ Cartridge $49.95

Shipping & Handling:

UPS Surface (USA Only) $3.00

Foreign (Air Mail Only) $13.00

Master Card, Visa, and Amex Welcome

To Order Toll Free 800-421-7731

From California 800-421-7748

Tech Support 916-823-3284

JASON-RANHEIM

1805 Industrial Drive

Auburn, CA USA 95603

First, Fast... and Still the Best!

We're the first company to offer fast, expert Commodore service anywhere in the USA. And we're still the best!

For one low price, we repair all problems on most types of Commodore equipment. All regular repairs carry a 30-day warranty, with a full-year warranty available for only $30 more. For preventive maintenance, we also offer a 1-Year service Contract at a savings of $20.00. Check our low prices!

	Repair with 30-day Warranty	Repair with 1-Year Warranty	1-Year Service Contract
C-64 or C-128 Computer	$59	$89	$69
1541 or 1571 Drive	65	95	75
1702, 1802 or 1902 Monitor	75	105	85
MPS-801, 802, 1525 or 1526	59	89	69
1541 or 1571 alignment (only)	Just $29.95		

And as an extra benefit — our repair customers are eligible for big discounts on software and hardware purchases.

Call for best prices on Amiga, Okidata and Epson.

FREE PERMANENT FIX

A $69.95 value — includes alignment and modification to stay in alignment. FREE for a limited time with any 1541 repair!

For fast, expert service . . . Just call our toll free number today!

1-800-624-6794

(For your convenience, have your equipment serial number and credit number ready. Checks and money orders also accepted). Add $7.50 for shipping — includes two-day air service anywhere in the Continental USA. For APO-FPO and P.O. Box addresses, add $15.00 for shipping (excluding air freight).

TRIAD COMPUTERS

3402-E W. Wendover Ave., Greensboro, NC 27407
1-800-624-6794 or (919) 299-0391

FasTec

Fast-Key KEYBOARD ENCHANCER FOR THE C128 **$39.95** Disk

Fast-Key is a memory resident program that allows you to program any key on your 128's keyboard with any character or character string you desire.

- Redefine keys ON-LINE!
- Save definitions to disk
- Enter BASIC keywords with a SINGLE keystroke!
- Make your numeric keypad perform cursor control and editing functions!

FISC-128 FEET, INCHES AND SIXTEENTHS CALCULATOR **$39.95** Disk

This calculator program turns your C128 into a real time saver. Great for DRAFTSMEN, ARCHITECTS, CARPENTERS, or anyone who deals with feet, inches and sixteenths!

- F.I.S Calculator
- DECIMAL Calculator
- Works CIRCLES
- Works RIGHT TRIANGLES
- Does CONVERSIONS

205-653-4330

SEND CHECK/MONEY ORDER TO:
FASTEC, INC.
P.O. BOX 5129, MOBILE, AL 36605
Alabama residents add 4% sales tax

VISA MasterCard

1986 TAX RETURN HELPER

Fast and easy income tax preparation

- This is the 6th annual edition - thousands of repeat customers
- Prepares Form 1040, Schedules A (Itemized deductions), B (Interest), C (Business), D (Capital gains), E (Supplemental income), G (Income averaging), SE (Self-employment tax), W (Married couple deduction), Forms 2441 (Child care credit), 2106 (Employee expenses) and 4562 (Depreciation).
- Works like a spreadsheet - all the lines affected by a change are instantly updated.
- Data can be printed, saved on disk and updated.
- Also included:

TAX DBASE

A data base program to create and maintain files of tax related items (medical, car expenses, etc.) that can be used directly by the tax programs.

- Can be used all year round. Also good for many other accounting jobs (checkbook balancing, etc.)

Price is **tax deductible.** C64 disk. Standard version: $33 (+ $1.50 S&H)

PROFESSIONAL VERSION - also prints data on IRS forms: $45 (+ $1.50 S&H)

Previous customers prices: $21.50 (standard) and $29.50 (pro-version) (+ $1.50 S&H)

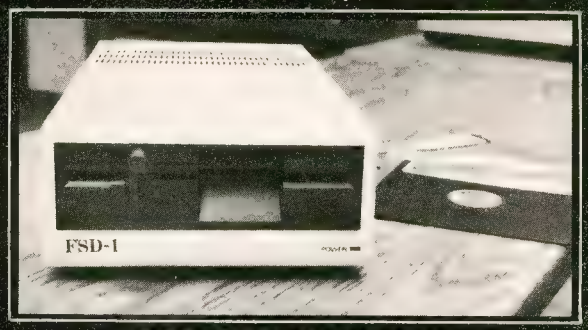
Availability: end of December, 1986

KSOFT CO.
845 WELLNER RD.
NAPERVILLE, IL 60540
(312) 961-1250

VISA MasterCard

SATISFACTION GUARANTEED OR MONEY BACK

Commodore Compatible and only... $139.00



FSD-1 5¼"Disk Drive
Directly replaces the Commodore 1541 disk drive.

The FSD-1 Disk Drive is a versatile and efficient disk drive built for the Commodore series of personal computers. This disk drive is fully compatible with the Commodore 64* computer and directly replaces the Commodore 1541 Disk Drive.

Special Features

- Runs all C-64 commercial software
- Ready to run right from the box
- Full 6 month warranty
- Heavy duty construction
- Vented metal chassis
- Built especially for C-64 users

Visa & MasterCard welcome. Credit card orders shipped in 24 hrs. Allow $12.00 shipping and handling. Send mail order with payment to:

To Order call toll free
1-800-356-5178

ECI

Emerald Component International
Dept. S
541 Willamette Street
Eugene, OR 97401
Tel. 503-683-1154

COMMODORE 64 is a registered trademark of Commodore Electronics, Ltd.

All programs listed in this magazine are available on the GAZETTE Disk. See elsewhere in this issue for details.

A Printer For All Reasons

Search For The Best High Quality Graphic Printer

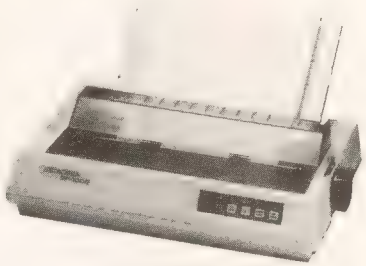
The Results Are In We ran many printers through our battery of tests and this one came out first in its class. Our SP-1000, built by Seiko is a 100 characters per second, (12 horizontal by 9 vertical matrix), full bi-directional, logic seeking, true descender printer. The character matrix in NLQ (Near Letter Quality) mode is a very dense 24 (horizontal) by 18 (vertical).

Features That Won't Quit With the SP-1000 your computer can now print 40, 48, 68, 80, 96, or 136 characters per line. You can print in scores of style variations. You not only have standard Pica, Elite, Condensed and Italics, but also true Superscripts and Subscripts. Use **bold**, or *italics* to make the words stand out. Or, if you wish to be even more emphatic, underline the words. You can combine many modes and styles to make the variation almost endless.

Forms? Yes! Your Letterhead? Of Course! The tractors are adjustable from 4 to 10 inches. You can also use single sheets, plain typing paper, your letterhead, short memo forms, labels, whatever you choose. Any size to 10" in width. It will even load your paper automatically. Multiple copies? Absolutely! Use forms up to 3 thick. Spread sheets with many columns? Just go to condensed mode printing and print a full 136 columns wide all on a standard 8½" wide page. Forget expensive wide-carriage printers and having to change to wide carriage paper.

An Extra Long Life (2.5 million character) ribbon cartridge is only $11.00. Order #2001. You need absolutely nothing else to start printing—just add paper (single sheet or fanfold tractor).

NOW ONLY $169.95!



The warranty has now been extended to 2 years and service centers are located nationwide for your convenience.

The Bottom Line:

Commodore C-64 & C-128, Order #2200. graphics interface & cable built in. **$169.95**

IBM-PC and compatibles, Order #2100, **$189.95** plus 8' shielded cable #1103, $16.95

Apple IIc or Macintosh, Order #2300, **$194.95** with cable, specify computer

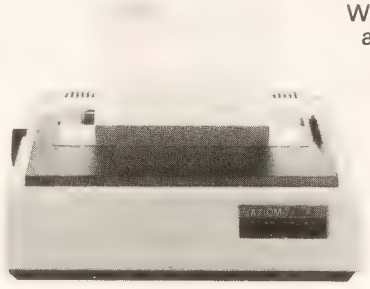
Standard Parallel with 36 pin Centronics connector, Order #2400, **$189.95** no cable

Standard Serial with RS-232 (DB-25) Connector, Order #2500, **$189.95** no cable

Shipping in cont. US is $10.00. UPS Blue is $22.00.

Affordable Letter Quality

Finally, for the small personal computer owner there is an affordable **true** letter quality printer. This superb Daisy Wheel is manufactured by Silver Reed and has a very simple and reliable mechanism. It prints at 10 cps and has virtually all the features of its larger counter parts including: bold, underlining, superscript, subscript and dot graphics mode. The print head is logic seeking and it uses both carbon film and nylon ribbons plus 96 character printwheels available everywhere. We now have this available in a Commodore version, the **Elite-5 CD** which has both Commodore connector and cable **plus** a centronics parallel input for other computers. This is truly a remarkable value, priced at less than a dot matrix. Limited quantity, call your order now.

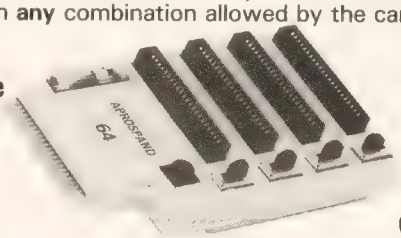


ELITE-5
$174.95
Order #1805

ELITE-CD
$184.95
Order #1806

Aprospand-64™ Gives your Commodore 64 or 128 full expandability! This superbly designed expansion module plugs into the expansion port & gives you 4 switchable (singly or in any combination) expansion connectors—plus fuse protection—plus a reset button! Before you buy an expander, be sure that it has a fuse to protect your computer and that you can activate your cartridges in **any** combination allowed by the cartridges.

Fully C-128 Compatible



The Original

NOW ONLY $29.95

Commodore Interfaces and Cables

Cardprint G-WIZ Printer Interface #1108.....**$46.95**
Cardprint B/PS (without Graphics) #1105.....**$35.95**
Amiga Printer Cable (6 ft) #3040-6MF.....**$17.95**
Amiga Printer Cable (10 ft) #3040-10MF.....**$21.95**
Commodore 6 Pin Serial Cable (5 ft) #3006-5MM...**$ 6.95**
Commodore 6 Pin Serial Cable (8 ft) #3006-8MM...**$ 8.95**

Add Shipping Per Item: $3.00 Cont. U.S. $6.00 CAN, PR, HI, AK, APO, UPS Blue

ORDERING INFORMATION California residents add 6% tax. All prices are cash prices — VISA and MC add 3% to total We ship the next business day on money orders, cashier's checks, and charge cards. A 14-day clearing period is required for checks. Prices subject to change—CALL Dealer inquiries invited

For information call **805/987-2454**
TO ORDER CALL TOLL FREE
1 (800) 962-5800 - USA (8-8 PST)
1 (800) 962-3800 - Calif.

Or send order to:

APROTEK DEPT. CG

1071-A Avenida Acaso, Camarillo, CA 93010

COMB

Authorized Liquidator

Commodore 64 BUSINESS SOFTWARE

A 4-pack of most needed software for efficient business operations!

General Ledger
- Has 8 general ledger options.
- Provides 150 chart-of-accounts.
- 1500 general journal transactions.
- Maintains account balances for month, quarter and year.
- Custom income statements, trial balances, full reports and more.

Inventory Management
- Tracking of 1000 inventory items.
- Maintains perpetual inventory records.
- Calculates use, reorders, cost averaging, etc.

Payroll
- Provides 24 different payroll functions.
- Calculates payroll and tax deductions.
- Prints payroll checks.
- Interfaces with General Ledger software.

Accounts Payable/Checkwriting
- Combines tracking of vendor payables with an integrated checkwriting system.
- Maintains master file, provides invoice listings.
- Gives aging report by 30, 60, 90 days.
- Interfaces with General Ledger software.

90-Day Limited Factory Warranty.

Mfr. List: $199.80
ENTIRE SET of 4 Liquidation Price $39

Item H-1762-7025-059 Ship, handling: $4.00

NOTE: Also available by individual titles. Phone for prices.

Credit card customers can order by phone, 24 hours a day, 7 days a week. VISA MasterCard AMERICAN EXPRESS

Toll-Free: 1-800-328-0609

Sales outside the 48 contiguous states are subject to special conditions. Please call or write to inquire.

SEND TO: **Item H-1762**
C.O.M.B. Direct Marketing Corp.
1405 Xenium Lane N/Minneapolis, MN 55441-4494

Send ___ **Commodore Business Software Set(s)** Item H-1762-7025-059 at $39 each plus $4 each for ship, handling. (Minnesota residents add 6% sales tax. Sorry, no C.O.D. orders.)

☐ My check or money order is enclosed. (No delays in processing orders paid by check.)

Charge: ☐ VISA® ☐ MasterCard® ☐ American Express®

Acct. No. _____ Exp. _____

PLEASE PRINT CLEARLY

Name _____

Address _____

City _____

State _____ ZIP _____

Phone ( ) _____

Sign Here _____

COMBCOMBCOMB

ATTENTION ALL COMMODORE CBM USERS!

This could be your last opportunity to add on or replace your existing equipment at the lowest price ever.

commodore

COMMODORE CBM COMPUTERS

8032..... $ 275.00
4032 (Pet) ..... $ 229.00

COMMODORE CBM DISK DRIVES

8050 (1mg) ..... $ 395.00

COMMODORE CBM PRINTERS

8023P (160cps) ..... $ 129.00
4023 CBM (100cps) . $ 115.00

COMMODORE CBM CABLES

Pet-IEEE..... $ 29.00
IEEE-IEEE ..... $ 32.95

ALL PRODUCTS ARE BRAND NEW IN ORIGINAL COMMODORE BOXES.

ALL PRODUCTS ARE GUARANTEED FOR 60 DAYS.

MasterCard & Visa accepted add 3% surcharge for credit cards

F.O.B. Dallas, Texas

ORDERS ONLY CALL
1-800-527-1738

INQUIRIES & INFORMATION PLEASE CALL
1-214-231-2645

Micro-Sys
DISTRIBUTORS

641 Presidential Drive
Richardson, Texas 75081
9:00 a.m. - 4:30 p.m. (Mon.-Fri.)

GREAT PRICES ON DISKS FOR THE COMMODORE!

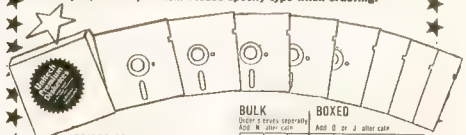
FROM 29¢

WE DON'T SELL FANCY NAMES, BUT WE SURE SELL THEIR DISKS!
When you buy a name-brand disk, you pay for more than just the disk, you pay for fancy advertising, fancy packaging. But when you buy a UNITECH disk, you get a PREMIUM QUALITY, HIGH RELIABILITY, fully guaranteed disk, identical to disks that sell for many times our price! When you buy a more expensive diskette, you aren't necessarily buying a better product.

WHO MAKES UNITECH DISKS?
They are made by top USA makers, and should not be confused with low-ends or seconds. Since we are one of the largest disk buyers in the world, the manufacturers give us their best prices! In our agreements with the manufacturers, we can't reveal their names, but when you receive them you'll recognize these as among the highest-quality disks made!

GREAT PRICE AND HIGH QUALITY!
We've tried almost every brand of disk made, but we haven't found a more reliable, higher quality disk than the Unitech Disk. Unitech is so sure that our disks are 100% perfect that we offer our famous UNCONDITIONAL 30 MONEY-BACK SATISFACTION GUARANTEE, AND OUR LIFETIME REPLACEMENT WARRANTY!

PROPERLY PACKAGED & PRICED!
You can buy Unitech disks BULK (N-Pak) no sleeve or box; BOXED IN TENS (D-Pak) or BOXED IN 25's (J-Pak) with label, sleeve, box, and tabs. *Order D-pak, add 2¢ per disk.* Please specify type when ordering.



PRICES ARE PER DISK	BULK (Order 3 sizes separately. Add N after each)			BOXED (Add D or J after each)				
	100	500	1K	10	25	100	500	1K
For the Apple II, II+, IIe, IIc #UDA	33¢	31¢	29¢	40¢	38¢	37¢	36¢	34¢
SS/DD for single side computers #UD1	34¢	32¢	29¢	41¢	39¢	38¢	37¢	35¢
DS/DD for IBM-PC and compatibles #UD2	35¢	33¢	29¢	42¢	40¢	39¢	38¢	36¢
DS/Hi-Density for IBM-AT #UAT	1.59	1.49	1.39	1.71	1.69	1.64	1.54	1.44
DD/DD colored disks #UC2	65¢	62¢	56¢	76¢	74¢	69¢	67¢	61¢
3½", single side for Mac #UD3	1.19	1.15	99¢	1.51	1.29	1.19	1.15	99¢
3½", double side for Mac & Amiga #UD6	1.39	1.27	1.19	1.66	1.49	1.39	1.27	1.19
5¼", 24# white wove #SLV	4¢	3.5¢	3¢	Call for pricing on qty's over 1000				
5¼", white tyvek #TYV	6¢	5¢	4.5¢					

MORE GREAT PRICES!

COPY II FOR COMMODORE SOFTWARE, backs up protected programs #C2COM $39
RIBBONS FOR COMMODORE 801 #PR494 $5.80ea 12/$63.80
RIBBONS FOR COMMODORE 803 #PR495 $5.80ea 12/$63.80
RIBBONS FOR COMMODORE 4022/8022, EPSON MX80 #PR470 $4.50ea 12/$49.50
RIBBONS FOR COMMODORE 2022/2023, GEMINI 10/15/15X #PR180 $2.15ea 12/$23
RIBBONS FOR OKIDATA 80/81/82/82A/83/83A/92/93 #PR180 $2.15ea 12/$23.65
RIBBONS FOR EPSON MX/RX/FX80, #PR470 $4.50ea 12/$49.50
GIANT DISK STORAGE FILE holds 100 disks, removable top w/lock/key #F100 $11.88
GIANT FLIP-TOP STORAGE FILE, holds 100 disks, flip-top #F101 $11.88
LIBRARY DISK STORAGE CASES, clear plastic #F10 99¢ea, 10 for $9.50
RIGID-PAK DISK CARRIER MAILER, hard plastic, holds 5 disks #RPAK 99¢
UNIPAK CARDBOARD DISK MAILERS, holds 3 disks & letter. 6x8" #UNIPAK 10/$5
COMPUTER POWER CABLES, fits Apples, IBM & compatibles 5ft #CPC $2
DB25 GENDER CHANGERS, all pins wired, choose M/M (#MMGC) or F/F (#FFGC) $7.77

INCREDIBLE PRICES ON ACCESSORIES!

UNI-NOTCH DISK NOTCHER $7.77 — Access 2nd side of disk #NN1

SURGE PROTECTOR $19 — Six switched outlets w/circuit breaker #ACPC2

FLIP-TOP DISK FILES $8.88 — Holds 70 disks #F70

A/B PARALLEL (#ABPAR) OR SERIAL (#ABSER) SWITCH BOX, your choice $39
5¼" CLEANER KIT, cleaner disks & solvent for 45 cleanings! #HCK $4.95
COLOR DISK ASSORTMENT, 25 disks w/slvs, DS/DD, #UC2J-ASST $19.75 (79¢ea)
COMPUTER MAILING LABELS, std 5 lines x 3.5" #LAB $14.95 box of 5000
MONITOR GLARE SCREENS, for all 12" diag monochr. monitors #GLS $13.88
ANTI-STATIC TOUCH STRIP, attaches to keybd, grounds static #TMF $9.95
BREAKOUT BOX, matches serial cables, economy solderless type #T009 $14.88
WRITE PROTECT TABS, #TAB 100 tabs $1.00, 1000 tabs $9
RS232 SERIAL TESTER, checks & troubleshoots all serial lines #T006 $11.88

DS/DD COLORED DISKS
Helps keep files organized! Available in light blue, dark blue, yellow, green, brown, red, lavendar, maroon, grey, white, magenta, orange. Packed 25 per pack, order in multiples of 25 per color. Mix and match colors for quantity discounts! Notched, with hub rings. Comes with sheets of labels, write protect tabs. Purchase sleeves separately. For the IBM-PC, compatibles, Apple II series, Commodore, TRS-80, Atari, Kaypro, etc. Order by #UC2N-color
See chart for prices.

HOW TO ORDER: Pay by MC-Visa-Amex-COD, or send check with order. Min order $20, add $3 for UPS shipping +$2 # COD (no extra charge for credit cards). We can ship open account to schools, min school purch order $100, FOB Unitech. All orders must include daytime phone and STREET address. MONEY BACK 30-DAY SATISFACTION GUARANTEE! SEND FOR FREE CATALOG LISTING 100'S OF COMPUTER BARGAINS!

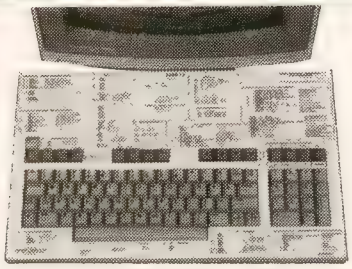
UNITECH 20Z HURLEY STREET CAMBRIDGE, MA 02141-2176 IN MASS (617)"UNITECH"

24 HOURS A DAY, 7 DAYS A WEEK!

800)343-0472

LEROY'S CHEATSHEET®

Keyboard Overlays

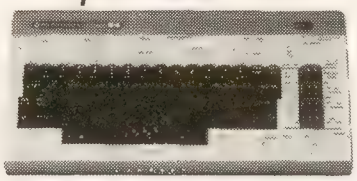


$7.95 each

For your **COMMODORE 128**

PLASTIC LAMINATED

$3.95 each



For your **COMMODORE 64**

Put Your Computer's Commands Where They Belong - And Your Manuals On The Shelf.

Have you ever sat at your computer with the manual in your lap trying to find an elusive command? How much time have you lost searching through manuals to refresh your memory on how to do what you wanted? Now you have a way to end that frustration - **Leroy's Cheatsheets®**

Leroy's Cheatsheets help you get into your program right away. We put the commands right at your fingertips, actual keystrokes are in **bold** type, variables are shown in *italics*. Designed by software experts, our durable plastic laminated overlays are comprehensive reference aids which document a product or system completely. Now use your software more easily and more effectively. With Leroy's Cheatsheets you'll never have to hunt for a program command again!!!

See below for ordering information.

SOFTWARE

DISCOUNT SOFTWARE & FREE CHEATSHEET

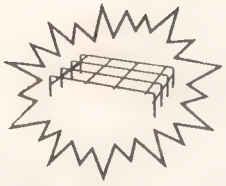
We carry a complete line of software at competitive prices. **PLUS** - on any software package of $25.00 or more you get a ***FREE*** **Leroy's Cheatsheet®** of your choice! CALL or WRITE TODAY for prices.

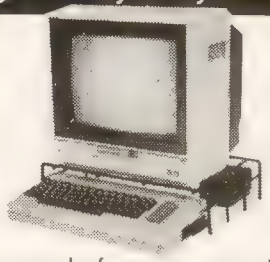
The Problem Solver

EQUIPMENT STAND

By Leroy

ONLY $ 19.95





Made of **sturdy vinyl coated steel**-strong enough for any computer equipment. This equipment stand will help you **organize your system**. With this unique construction, cables are never in the wrong place, switches are more accessable and your equipment **stays cooler**. The problem Solver Equipment stand was **specially designed** for Commodore computers 128 & 64. Keeps your monitor at eye level (Great for **printers** too).

See below for ordering information.

Order Now and Save ... Money, Time and Frustration

COMMODORE 128 *$7.95 ea*

Please send me the following **LEROY'S CHEATSHEETS** for the commodore 128 for only 7.95 each plus shipping .

DIE - CUT

- ❑ Basic 7.0
- ❑ Blanks (3-NOT laminated)
- NEW ❑ **Data Manager 128**
- ❑ Disk 1571
- ❑ Easy Script
- NEW ❑ **Elite**
- ❑ Fleet system 2 & 3
- NEW ❑ **Flight Simulator 2**
- ❑ For The Beginner
- ❑ Multiplan 128
- NEW ❑ **Paperback Writer**
- ❑ Paperclip 128
- ❑ Superbase 128
- NEW ❑ **Superscript 128**
- ❑ Wordpro 128
- NEW ❑ **Word Writer 128**

***FREE* - Keyboard extender** (each order)

COMMODORE 64 *$3.95 ea*

Please send me the following **LEROY'S CHEATSHEETS** for the COMMODORE 64 for only $3.95 each plus shipping.

CUT-OUT-YOURSELF ON DOTTED LINES

- ❑ Basic 2.0
- ❑ Blanks (3-NOT laminated)
- NEW ❑ **Data Manager**
- ❑ Disk 1541
- ❑ Doodle
- ❑ Easyscript
- NEW ❑ **Elite**
- ❑ Fleetsystem 2
- ❑ Flight Simulator 2
- ❑ For The Beginner
- NEW ❑ **GEOS**
- ❑ Multiplan
- NEW ❑ **Newsroom**
- NEW ❑ **Paperback Writer**
- ❑ Paperclip
- ❑ Sky Travel
- ❑ Speedscript
- ❑ Superbase 64
- NEW ❑ **Superscript 64**
- NEW ❑ **Word Writer**

Also fits the COMMODORE 64C

❑ Please send me **Equipment stands** for only ***$19.95*** each plus shipping.

HOW TO ORDER:

* Send personal check, money order or Master Card / VISA card information.

SHIPPING:

* Leroy's Cheatsheets - ***$1.00*** per order (Foreign Orders ***$3.00***)
* Equipment Stand ***$3.00*** each Cont U.S. ***$5.00*** -each Canada, Alaska, Hawaii

No foreign orders please

TAXES:

* Add 6% sales (include shipping) for Pennsylvania residents only)

Phone orders welcome HOURS: **7:30** AM - **5** PM Eastern Time Monday thru Friday

GAZ 12

Name _____

Address _____

City _____ State ___ Zip _____

No surcharge for Visa or Master card

U. S. FUNDS ONLY NO C.O.D

❑ VISA ❑ MASTER CARD ❑ PAYMENT ENCLOSED (check or money order)

CARD # _____ Exp ____/____

CHEATSHEET PRODUCTS, INC. P.O. Box 111368 Pittsburgh, PA. 15238 (412) 781-1551

COMMODORE 64 is a registered trademark of Commodore Electronics, Ltd. COMMODORE 128 is a trademark of Commodore Electronics, Ltd.

DSI

DIGITAL SOLUTIONS INC.

SERVICE CENTER

Commodore®

C-64	Repair (CPU only)	$ 38.95
1541	Alignment	$ 25.00
1541	Repair	$ 69.95
C-128	Repair (CPU only)	$ 74.95
1571	Alignment	$ 35.00
1571	Repair	$125.00
C-64	Power Supply	$ 21.95
C-128	Power Supply	$ 89.95

Includes parts and labor
(Power Supply extra)

To save C.O.D. charges, send unit and power supply with check or M.O. to:

DIGITAL SOLUTIONS, INC.
1122 9th Street
Altoona, PA 16601
(814) 944-0405

MasterCard VISA DISCOVER

© 1986 DSI, ALTOONA PA

DISCOVER THE HIDDEN POWER!

- Control lights, appliances, heating & cooling systems, relays, motors and virtually any electrical device.
- Connect to temperature, light, sound, moisture, fluid level, pressure and vibration sensors - plus many more.
- Perform automated tests and experiments.
- Use for laboratory data acquisition.
- Access each memory mapped port via one statement in BASIC. **NO INTERFACE COULD BE EASIER TO USE.**
- 32 separate buffered digital output lines.
- 32 separate digital input lines.

- 1 channel A/D plug-in conversion module: **$30.**
- 8 channel A/D plug-in conversion module: **$45.**
- Security System Module, with super loud siren: **$25.**
- Beginner's Module with 8 LED's, 8 switches and 1 relay: **$25.**
- BH100 I/O Card: **ONLY $129!** User Manual includes instructions, sample programs & diagrams of typical hookups.
- BH100, Beginner's Module and Course Book: **$159.**
- Beginner's I/O Interface Course Book: **ONLY $15!** Let us take you by the hand into the mysterious but fun & exciting world of computer I/O interfacing!

Add $2 for postage and specify C-64, VIC-20 or Apple 2+/2e
Cash, COD, Visa and Master Card

Intelligent I/O
P.O. Box 70 Potsdam, NY 13676
(315) 265-6350

Free Spirit Software, Inc.

Music of the Masters - Classical music for the C64* or C128* in 64 mode. Approx. 1 hour of music per disk with comments on the composers.
Volume I - Mozart's Rondo Alla Turca, Beethoven's Sonata Pathetique and 20 other works by Bach, Handel & many others.
Volume II - Beethoven's Minuet in G, Bach's Invention No. 4, and 40 other works by Brahms, Schubert, Chopin & others.
Volume III - Mostly Mozart. Overture from Figaro, Sonata Facile, Minuet from Don Giovanni and many other Mozart compositions.
$9.95 per volume. All 3 volumes - $24.95

The Great War - WWI strategy game for the C128* in 128 mode. Includes one or two player options. Armies of 17 countries. Weather, terrain, lines of supply, etc. affect the outcome. C128* disk only - $29.95

BASICally SIMPLE 128 - How to use all C128* Basic 7.0 commands, functions and operators in Basic programs. C128* disk only - $19.95
BASICally SIMPLE 64 - How to use all C64* Basic 2.0 commands, functions and operators in Basic programs. Disk - $14.95

Datafiler 128 - Database program for the C128* in 128 mode. Disk - $24.95

FREE SHIPPING & HANDLING. Illinois residents add 7% sales tax. Send check or money order to:

Free Spirit Software, Inc.
538 S. Edgewood
LaGrange, IL 60525

*Trademarks of Commodore Electronics, Ltd.

Commodore 64 SOFTWARE Only $4/Disk

- ☐ **003 Best of Tpug** - Utilities, Term 64 (modem program).....$4
- ☐ **034 Public #4** - Sampler of various games and utilities.....$4
- ☐ **035 Best of Canada** - Games and music $4
- ☐ **059 The Accountant** - Spreadsheet, Checkbook balancer, Graphics, Mailing list.....$4
- ☐ **066 Best Utilities V.1** - Copy disks with a single drive in 4 minutes.....$4
- ☐ **075 The Office** - Wordprocessor, C64 Database, 7 games, Special disk utility program and 35 more programs.....$4
- ☐ **080 Superstar Utilities** - Disk recovery, Label Maker and more; 39 programs in all..$4
- ☐ **085 Space Games** - Starwars, Startrek, Eliza, Easy Dungeon, Planet Probe, Deep Space plus 8 other popular games.....$4
- ☐ **094,095 Best Utilities V.2 (2 disks)** - Communications, BBS lister, Disk doctor.....$8
- ☐ **102 Best Games from England** - Software Pirates, Triads, Brickbuster, Stellar Strike, Space Arena.....$4

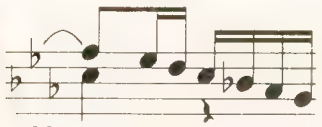
Add $4 shipping & handling per order. CA residents add 6.5% sales tax
Amount enclosed $_____ ☐ Check ☐ VISA ☐ MasterCard
Card No. _____
Signature _____ Exp. Date _____
Phone (_____)_____
Name _____
Address _____
City _____ State ____ Zip _____
Call toll free **800-431-6249** in Calif. **415-550-0512**

BLACKSHIP COMPUTER SUPPLY C110
P.O. Box 883362 San Francisco, CA 94188

Learn to
PLAY THE GUITAR
the EASY way with
Easy Guitar

Order today and be on your way to fame and fortune! Easy Guitar is the equivalent of dozens of guitar lessons.
C-64 disk
$29.95 plus $2.00 shipping & handling

VISA & MC Accepted
or send check or money order to:

PJ SOFTWARE
10636 Main St., #414 • Bellevue, WA 98004
(206) 883-9257
Dealer inquiries welcome

MIDI
HARDWARE
SOFTWARE

- COMPUTER MUSIC SPECIALISTS
- THE BEST PRICES
- ALL MAJOR BRANDS
- TECHNICAL SUPPORT

★ Synthesizers and Drum Machines
★ Computer Software and Hardware
★ Sequencers, Programmers
★ Home Recording Equipment

SEND FOR FREE CATALOG

BOOKS ON MIDI, MIDI PRODUCTS
- Understanding Midi - 82 Pages..... 3.95
- How to Understand & Program the DX7... 24.95
- Synthesizer Technique 9.95

Send cost plus $1.50 postage/handling per book to the address below or call toll free to order

START YOUR COMPUTER MUSIC SYSTEM TODAY
$275 CASIO CZ101 SAVE $225
PROFESSIONAL SYNTHESIZER SOUND, UP TO FOUR UNIQUE SOUNDS AT ONCE. PROGRAMMABLE. PORTABLE. EASY TO USE — THE STANDARD —
FREE AC ADAPTER & SHIPPING

$99.95 MUSIC SHOP WITH MIDI
SAVE $50 Your Commodore 64 computer can now play any MIDI synthesizer! Perfect for the CZ101, with 4 different sounds at once! You can write with the keyboard!

$99.95 MIDI INTERFACE with Drum Sync
$89.95 VOICE EDITOR/LIBRARIAN For CZ
$59.95 MIDI INTERFACE - 1 Input, 2 Output, No Sync

FUTURE MUSIC

800-FOR-MIDI (800) 367-6434 OR (702) 826-6434
1465 Terminal Way. Mail Orders & Correspondence to: P.O. Box 1090, Reno, NV 89504.
For Cust. Service Call (702) 359-6434, 10-6, M-F

THE LOWEST PRICES | THE BEST SERVICE

ELECTRONIC ONE*

PHONE LINES OPEN 10-6 E.S.T. M-F

CALL (614) 864-9994 • P.O. Box 13428 • COLUMBUS, OHIO 43213

commodore

SOFTWARE UTILITIES/BUSINESS

CERTIFICATE MAKER	26.99
PRINT MASTER	27.99
PRINT SHOP	24.99
GRAPHIC LIBRARYS	14.99
PAPER CLIP	34.99
PAPER CLIT W/SPELL	39.99
GEOS	39.99
MUSIC SHOP	28.99
PRINT SHOP COMPANION	24.99
MULTI PLAN 128	37.99
SUPER BASE 128	57.99
SUPER SCRIPT	46.99
DATA MANAGER	39.99
PARTNER	39.99
SWIFT CALC/SIDE 128	39.99
PAPERBACK WRITER	27.99
HES MULTI PLAN	21.99
FAST LOAD	22.99
MACH 5	22.99
MACH 128	27.99
NEWSROOM	29.99
CLIP ART I	18.99
EASY SCRIPT	24.99
SPELL WIZARD	19.99
LETTER WIZARD	19.99
DATA MANAGER 128	39.99
PORTER'S FINANCE	39.99
WORD WRITER 128	39.99
MICROSOFT MULTIPLAN	24.99
BETTER WORKING SPREAD SHEET	29.99
FILE & REPORT	29.99
WORD PROCESSOR	29.99
JANE	34.99

SOFTWARE

ACE OF ACES	18.99
DECEPTOR	18.99
CARMEN SAN DIEGO	19.99
NEVER ENDING STORY	18.99
JET	24.99
MOVIE MONSTER	22.99
SUPER CYCLE	22.99
W.G. BASEBALL	18.99
COMPUTER BASEBALL	24.99
COMPUTER QUARTERBACK	24.99
2 ON 2 BASETBALL	22.99
AUTO DUEL	29.99
SILENT SERVICE	22.99
SUPER HUEY II	18.99
ON COURT TENNIS	19.99

COMMODORE

C128 COMPUTER	269.99
C64 COMPUTER	139.99
64C COMPUTER	179.99
1541 DRIVE	179.99
1571 DRIVE	239.99
1802 MONITOR	179.99
1902A RGB MONITOR	279.99
MPS 1200 PRINTER	249.99
1350 MOUSE	39.99
1670 MODEM	149.99
128K UPGRADE	109.99
512K UPGRADE	159.99
AVATEX 1200 MODEM	76.99
TOTAL COMM. MODEM	29.99
MESSENGER MODEM	29.99
VOICE MESSENGER	19.99

HARDWARE PRINTERS

COMREX 220	59.99
STAR NX10	239.99
STAR GEMINI II	239.99
PANASONIC 1091	219.99
SEIKOSHA	179.99
EPSON LX80	229.99
TRACTOR LX80	24.99
CANON INK JET	239.99
STAR POWERTYPE	249.99

MONITORS

THOMPSON 14" COLOR	129.99
SAKATA 13" COLOR	139.99
NAP 12" AMBER	69.99
XETEC JR.	36.99
XETEC SR. (8K BUFFER)	56 99
TYMAC INTERFACE	39.99

SOFTWARE ENTERTAINMENT

PINBALL CONSTRUCTION	11.99
WORMS	11.99
AXIS ASSASSIN	11.99
TOUCHDOWN FOOTBALL	11.99
MAIL ORDER MONSTERS	11.99
ONE ON ONE	11.99
ARCHON	11.99
MUSIC CONSTRUCTION	11.99
SUPER BOULDER DASH	11.99
SEVEN CITIES OF GOLD	11.99
FIGHT NIGHT	18.99
HARD BALL	18.99
ROCK & BOLT	19.99
ARCHON II	24.99
HEART OF AFRICA	14.99
DAM BUSTERS	18.99
CHESTMASTER 2000	24.99
BARD'S TALE	24.99
SUPER BOWL SUNDAY	18.99
SUMMER GAMES	22.99
SUMMER GAMES II	22.99
WINTER GAMES	22.99
KORONIS RIFT	22.99
BOB & WRESTLE	18.99
INFILTRATION	18.99
SPELL OF DESTRUCTION	18.99
FLIGHT SIMULATOR II	29.99
TOP GUNNER	18.99
10TH FRAME	23.99

SOFTWARE ENTERTAINMENT

CRUSH CRUMBLE	7.99
B.C. QUEST TIRES	7.99
OIL WELLS	7.99
ZORK 1	6.99
ZORK 2	6.99
ZORK 3	6.99
DEADLINE	6.99
SUSPENDED	6.99
STAR CROSS	6.99
RALLY SPEED WAR	6.99
CHESS	7.99
WIZZARD PRINCESS	7.99
DIG DUG	4.99
FRANKIE	24.99
LEADER BOARD	24.99
F-15	22.99
KARATEKA	18.99
KUNG FU MASTER	18.99
KUNG FU FIST	18.99
KUNG FU STICKS	18.99
WORLD KARATE	18.99
SARGON III	29.99
BEACH HEAD	22.99
BEACH HEAD II	22.99
HACKER II	24.99
LITTLE COMP. PEOPLE	24.99
SUBLOGIC BASEBALL	26.99
SUBLOGIC FOOTBALL	26.99
MICRO LEAGUE	

SOFTWARE SPECIALS

JUKEBOX	3.99
STORY MACHINE	3.99
ALPHABET 200	3.99
UP FOR GRABS	3.99
DELTA DRAWING	3.99
ADVENTURE CREATOR	3.99
COSMIC LIFE	3.99
FACEMAKER	3.99
LOGIC LEVELS	3.99
DANCE FANTASY	3.99
DUCKS AHOY	4.99
WEBSTERS WORD GAME	4.99
SEPETINE	1.99
SNAKE MAN	1.99
AZTEC	1.99
THE FACTORY	1.99
BRAVO	1.99
KID GRID	1.99
TURTLE TOYLAND JR.	1.99
ALF & COLOR CAVES	3.99
TRAINS	3.99
SNOOPER TROOPS	3.99
HEY DIDDLE DIDDLE	3.99
TROLL'S TALE	3.99
SPACE RESCUE	3.99
JUNO 1ST	3.99
LEARNING WITH LEEPER	3.99
JAWBREAKER II	3.99
BEAM RIDER	3.99
MR. ROBOT	3.99
GHOSTBUSTERS	7.99
SPARE CHANGE	2.99
PILOT	3.99
GRID RUNNER	3.99
HOT WHEELS	3.99
MR. KOOL	3.99
GYRUSS	4.99
HOME WORD SPELLER	4.99
DALLAS QUEST	6.99
STAMPS	4.99

SOFTWARE

STRIP POKER	22.99
ACTION BIKER	6.99
LAST V-8	6.99
NINJA	6.99
THE SLUGGER	6.99
BALLY HOO	22.99
INFIDEL	24.99
TRINITY 128	24.99
PLANET FALL	24.99
PHANTASIE	24.99

AMIGA SOFTWARE

HACKER II	28.99
MINE SHADOW	28.99
BORROWING TIME	28.99
DELUXE PAINT	64.99
ARCHON	26.99
ONE ON ONE	26.99
SKY FOX	26.99
ARTIC FOX	26.99
7 CITIES GOLD	26.99
DELUXE PRINT	64.99
PASS TOWN	32.99
MODULA II	59.99
LEADER BOARD	27.99
MEAD 18	27.99
MUSIC STUDIO	37.99
AEGIS AMI.	84.99
AEGIS DRAM.	119.99
GIZMOS	31.99
DELUXE VIDEO	64.99
MARBLE MADNESS	32.99
STRIP POKER	26.99
BRATACCAS	32.99
ROGUE	26.99
VIP	119.99

CALL FOR COMPLETE CATALOG

HOW TO ORDER: CASHIER CHECK, MONEY ORDER, MASTERCARD* OR VISA* (ADD 4% FOR CHARGE CARDS) . . . NO PERSONAL CHECKS . . . NO C.O.D.'S . . . SHIPPED U.P.S. . . . ALL PRICES SUBJECT TO CHANGE WITHOUT NOTICE.
SHIPPING: ADD $3.00 ON ALL ORDERS UNDER $100.00 . . . ADD $5.00 ON ALL ORDERS OVER $100.00. ACTUAL FREIGHT CHARGED ON MULTIPLE ORDERS.
INTERNATIONAL: ACTUAL FREIGHT CHARGED ON ALL ORDERS OUTSIDE THE CONTINENTAL UNITED STATES INCLUDING A.P.O.
POLICIES: NO RETURNS WITHOUT A RETURN AUTHORIZATION . . . NO RETURNS UNLESS DEFECTIVE. ALL DEFECTIVES WILL BE EXCHANGED . . . NO EXCEPTIONS. PLEASE SPECIFY . . .

CALL OR WRITE FOR FREE CATALOG

CALL ELECTRONIC ONE (614) 864-9994 **P.O. BOX 13428 COLUMBUS, OHIO 43213**

COMMODORE 64™

SUPER SOFTWARE

New! Best of Games #3
Over 40 new games on 2 disks.
$17.95

New! Brain Games #1
Includes: "Stock Market," "City Manager," "Warehouse," Civil Battles" and many more fun Brain Games.
(12 Huge Programs) **$12.95**

New! Adventure #1
Includes: "Gladiator," "Trip to Atlantis," "Merlyn" and many more Adventure Games.
(13 Huge Programs) **$12.95**

Best of Games #1
The original. Over 50 games on 2 disks.
$17.95

Las Vegas #1
The Classic. Over 20 Las Vegas Games. Bestselling disk.
$12.95

New! Education #1
Great for schools. For kids between 5-15 years of age.
$12.95

Mixer #1 or #2
Two separate disks. Each with 20-30 different programs.
GAMES — MUSIC — BUSINESS/UTILITIES
Each Only **$9.95**

Synthesizer Sounds #1
Over 50 well conducted rock songs on 2 disks.
$17.95

ADD $2 ($3 FOREIGN EXCEPT CANADA) SHIPPING/HANDLING

SEND CHECK OR MONEY ORDER TO:

GSR
SOFTWARE COMPANY
538 So. 2nd St. • Albion, NE 68620

Commodore 64 is a trademark of commodore electronics ltd.

C64, VIC20 POWER SUPPLY

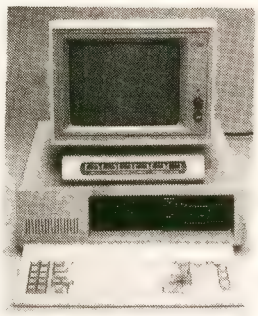
PS01 **$29.95**
UL LISTED EXTRA POWER TO TAKE CARE EXTRA LOADS AND HEATING PROBLEMS BEATS THE ORIGINAL

OUTPUT	MAXTRON	COMMODORE
5V DC	17A	12A
9V AC	10A	08A

Surge Protected & Noise Filtered Power Center.
(PO01) $55.

TAKECARE OF SURGE & NOISE FROM POWER SOURCE SIX LIGHTED SWITCHES CONVENIENT CONTROL FIVE OUTLETS UL LISTED STANDARD CIRCUIT BREAKER & SIX FOOT CORD IVORY COLOR SLIM CASE TO TAKE MIN SPACE UNDER YOUR MONITOR

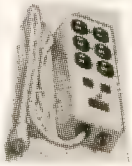
IBM PC/XT CLONE $599.



COMPLETE COMPATIBLE SYSTEM READY TO RUN.
640 MOTHERBOARD WITH 256K RAM, 4.77MH, 8 SLOTS, 360K DISK DRIVE, COLOR GRAPHIC CARD, 150 WATT, AT ALIKE KEYBOARD, DISK DRIVE CONTROLLER, CASE, & 12" AMBER MONITOR.
ONE YEAR LTD WARRANTEE. INEXPENSIVE TO START INTO A NEW WORLD OF APPLICATIONS, HUNDREDS OF PUBLIC DOMAIN SOFTWARES AT $5.00 ONLY.
IBM IS TRADMARK OF INTERNATIONAL BUSINESS MACHINE. PRICE ARE SUBJECTED TO CHANGE.
HURRY WHEN IT LAST!

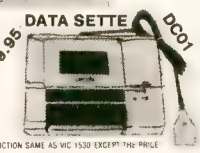
300 Baud Modem

$29
AUTO DIAL AUTO ANSWER UPLOAD & DOWNLOAD



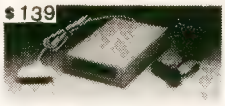
P02A $29.95 MODEM & POWER SURGE PRO-TECTOR

DATA SETTE **DC01**
$19.95



* FUNCTION SAME AS VIC 1530 EXCEPT THE PRICE

1200/300 Baud Modem
$ 139

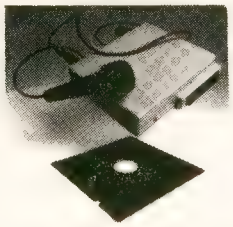


READY TO PLUG IN THE USER PORT NO OTHER INTERFACE NEEDED

MAXTRON 1825A DURFEE AVE., S. EL MONTE, CA 91733
(818) 350-5707 VISA & MASTERCARD ACCEPTED
SHIPPING & HANDLING ADD ON ABOVE PRICE DEALERS WELCOMED

DIGITAL SOUND SAMPLING

NOW FOR YOUR COMMODORE 64/128



COMPLETE
SAMPLER 64
SYSTEM
ONLY $89.95
READY TO USE
INCLUDES MICROPHONE

Record any sound into memory and replay it instantly over several octaves, ascending or descending scale, echo, reverb, endless looping, etc. Many professional and instructional uses and fun for hobbyists.

- Sample editing capabilities
- Full 8 bit ADC and DAC conversion
- Powerful sequencer with real time input
- Live effects menu with real time echo, reverb, digital delay, etc.
- Line and Mic input, line output and feedback control

DIGITAL DRUM BONUS!

Get the COM-DRUM Digital Drum Software for only $14.95 (Reg. $29.95) when purchased with the Sampler 64.

- Turns Sampler 64 into a digital drum machine
- Real time and step sequencer
- Polyphonic sound
- Includes Digitally Recorded Drumkit Samples and pre-programmed rhythms to get you started.

SEND CHECK OR MONEY ORDER TODAY TO:
MICRO ARTS PRODUCTS
P.O. Box 2522, Dept. CG
Philadelphia, PA 19147
(215) 336-1199
Include $3.50 shipping and handling. PA residents add 6% sales tax. Visa and Master Card Accepted.

CONVERSE WITH YOUR COMPUTER

AT LAST! A FULL IMPLEMENTATION of the original ELIZA program is now available to run on your Commodore 64!

Created at MIT in 1966, ELIZA has become the world's most celebrated artificial intelligence demonstration program. ELIZA is a non-directive psychotherapist who analyzes each statement as you type it in and then responds with her own comment or question—and her remarks are often amazingly appropriate!

Designed to run on a large mainframe, ELIZA has never before been available to personal computer users except in greatly stripped down versions lacking the sophistication which made the original program so fascinating.

Now, our new Commodore 64 version possessing the **FULL** power and range of expression of the original is being offered at the introductory price of only $25. And if you want to find out how she does it (or teach her to do more) we will include the complete **SOURCE PROGRAM** for only $20 additional.

Order your copy of ELIZA today and you'll never again wonder how to respond when you hear someone say, "Okay, let's see what this computer of yours can actually do!"

READ WHAT THE EXPERTS SAY ABOUT OUR VERSION OF ELIZA:

"Much more than a mere game...You'll be impressed with ELIZA...A convincing demonstration of Artificial Intelligence." —*PC MAGAZINE*

"Delightful entertainment...An ideal medium for showing off your system." —*MICROCOMPUTING MAGAZINE*

"ELIZA is an astounding piece of software...A fascinating program to use and study." —*BARON'S MICROCOMPUTER REPORTS*

"ELIZA is a great way to introduce your friends to computers...A very funny party game." —*PETER A. McWILLIAMS*

"ELIZA is an exceptional program, one that's fun to use, shows off your machine, and has great historical interest." —*POPULAR COMPUTING MAGAZINE*

"This version of ELIZA is the best we have seen. As a party game, it is unmatched." —*HOME APPLICATIONS FOR THE C-64*

ELIZA IS AVAILABLE IN THE FOLLOWING FORMATS:
(Please specify Disk or Cassette)

1. Protected Version $25
(Protected Version can be run but not listed or modified)
2. Un-protected Commodore 64 BASIC Source Version $45
(Source Version can be listed and modified as well as run)

Both versions include a six page user manual.

Please add $2.00 shipping and handling to all orders
(California residents please add 6½% sales tax)

ARTIFICIAL INTELLIGENCE RESEARCH GROUP
921 North La Jolla Avenue, Dept. G
Los Angeles, CA 90046
(213) 656-7368 (213) 654-2214
MC, VISA and checks accepted

LOTTO CIPHER™

GET THE BEST ODDS ON ANY LOTTERY
SIX NUMBER - PICK FOUR - DAILY GAME

- PRODUCES FOUR COMBINATIONS OF NUMBERS TO CHOOSE FROM.
- ANY AMOUNT OF BALLS AND NUMBERS CAN BE PROGRAMMED
- PRINTS OUT PAST LOTTO NUMBERS DRAWN, PAST COMPUTER PICKS, AND NUMBER DRAW FREQUENCY LIST
- COMPLETE NUMBER DATA BASE

$29.95 C-64 DISK

Window Magic

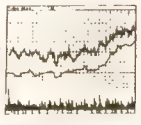
SUPER HI-RESOLUTION DRAWING IN MULTI OR MONO COLOR

• POLYGON SHAPES - EXPAND, SHRINK AND ROTATE THEN STAMP ANYWHERE • ZOOM - EXPANDS A WINDOW TO DOUBLE SIZE • MIRROR, FLIP, AND SCROLLING WINDOWS • COPY • CLONE COLOR ATTRIBUTES • ZOOM PLOT - DRAW ON AN EXPANDED WINDOW AND YOUR DRAWING AT THE SAME TIME • SAVE AND LOAD YOUR WINDOWS ON DISK • PRINTS ON STANDARD DOT MATRICS PRINTER • FILL • LINES • DRAW • TYPE LETTERS AND GRAPHICS • COLOR SQUARES

$24.95 C-64 DISK

STOCK BROKER™

PROFITS GUARANTEED OR YOUR MONEY BACK



BUYING GOOD QUALITY, VOLATILE ISSUES AND USING THE TRADING SYSTEM WILL HAVE YOU FULLY INVESTED AT THE LOWEST PRICES AND CONVERTING TO CASH AS THE STOCK NEARS ITS PEAK

- TECHNICAL TRADING THAT WORKS
- BAR GRAPH PRINT OUTS
- RECORD UP TO 144 STOCKS ON A DISK

$39.95 C-64 DISK

ABANDON SHIP™
S.O.S.

HI-RES ARCADE STYLE GAME THAT REQUIRES STRATEGY AND JOYSTICK SKILLS THERE ARE 52 ROOMS IN THE HMS BLACK THE BRIDGE, ENGINE ROOM, ARMORY, AND SUPPLY ROOM ARE THE MOST IMPORTANT TO PROTECT
GIVE MY REGARDS TO DAVEY JONES.

$21.50 C-64 DISK

ACORN OF INDIANA, INC.
2721 OHIO STREET
MICHIGAN CITY IN 46360
219-879-2284

SHIPPING AND HANDLING ADD $1.50 - C.O.D.'S ACCEPTED
VISA AND MASTER CARD ORDERS ADD 4%
INDIANA RESIDENTS ADD 5% SALES TAX

DUST COVERS

★ **CUSTOM MADE TO FIT**
★ **HEAVY 32-oz. VINYL ANTI-STATIC**
★ **EXTENDS EQUIPMENT LIFE**
★ **Choice of Colors Light Tan or Brown**

COMPUTERS		PRINTERS	
C-64; Plus 4	8.00	C-MPS/803, C-1520	8.00
C-128	13.00	Panasonic 1090/91	13.00
Datassette (C2N)	5.00	Gemini 10 & Star 10's	13.00
Amiga 1000	13.00	Gemini 15 & Star 15's	16.00
(W/Amiga Mon. Stacked)	28.00	Okidata 92	13.00
Keyboard only	7.00	Okidata 120/192	13.00
Atari 800XL, 130XE	10.00	Okimate 10/20	8.00
Atari 520 ST	14.00	Epson MX/FX/RX80	13.00
520 Keyboard (only)	10.00	Epson LX80/C-1000	13.00
IBM PC/XT	28.00	Seikosha SP-1000	13.00
IBM 5051 Keyboard	8.00	Comrex 220	13.00
(Dimensions Required for IBM Clones)		C'Itoh 7500	13.00
		Citizen MSP 10	13.00
		Atari 1027	13.00
		C/DPS 1101	16.00
DISK DRIVES			
C-1541, C-1571	8.00	**MONITORS**	
Amiga 3½" D/Drv	8.00	C-1702, BMC Color	16.00
Amiga 5¼" D/Drv	9.00	C-1902/Amiga	19.00
Indust GT, MSD SD-1	8.00	Amdek 500-700	19.00
MSD SD-2	10.00	Teknika MJ 10/22	19.00
Enhancer 2000	8.00	CM-141 (C-1802)	19.00
FSD-1	8.00	Gold Star 13" Color	19.00
Atari 1050	8.00	Thompson CM 365-66	19.00
VIDEO RECORDERS	13.00	C-1902A/Magnvx 40	19.00
State Make & Model Include Dimensions		Magnavox 80	19.00
		NEC 1225	19.00
		Taxan 220	19.00
PRINTERS		Sakata SC-100	19.00
C-1525/MPS 801	10.00	Zenith 122/123	19.00
C-1526/MPS 802	13.00	Zenith 131/133	23.00

Order by stating MAKE, MODEL and COLOR CHOICE - TAN or BROWN with check or money order plus $1.50 per item ($4.50 max.) shipping and handling (Foreign air extra). Calif. Res. Include 6.5% State Tax.

SPECIAL COVERS WILL BE MADE TO YOUR DIMENSIONS. SEND YOUR REQUIREMENTS FOR OUR LOW PRICE QUOTES.

Crown Custom Covers
9606 SHELLYFIELD RD., Dept. A
DOWNEY, CA 90240
(213) 862-8391

SEASONS GREETINGS

ABACUS

Ada Training Course	$29.95
Basic 128	42.95
Basic 64	29.95
Cadpak 128	45.95
Cadpak 64	29.95
Cadpak 64 w/Light Pen	69.95
Chartpak 128	29.95
Chartpak 64	29.95
Cobol	29.95
Personal Portfolio Manager	29.95
Powerplan	29.95
Super C Compiler 64/128	42.95
Super Pascal	45.95
Techinical Analysis System	45.95

BRODERBUND

Where in the World is Carmen Sandiago	29.95
P/S Library 1-2-3	15.95
Print Shop	26.95
Print Shop Companion	21.95

MICRO LEAGUE

General Managers Disk	$24.95
Micro League Baseball	24.95
Team Disks	16.95

RIBBON

Axiom Elite 5 LCD	$ 5.95
Brother 15, 25, 35	5.95
Commodore 1525	6.95
Commodore 1526	6.75
Epson 185	6.95
Epson 85	4.95
Epson mx, fx, rx 100	6.95
Epson mx, fx, rx, 1x 80	4.75
Gorilla Banana	6.95
Juki 6000	4.95
Juki 6100	3.95
Legend 880, 1080, 808	6.75
MPS 801	5.75
MPS 803	6.95
OKI 182, 192	9.75
OKi 82, 92, 83, 93	2.25
SG 10-15	2.25

(Min. 6 per order)

INFOCOM

Ballyhoo	$24.95
Enchanter	21.95
Hitchhicker's Guide	21.95
Invisiclues (all)	6.00
Spellbreaker	26.95
Zork 1-2-3	25.95
Trinity 128	24.95

PRECISION

Superbase 128	$56.95
Superbase 64	46.95
Superscript 128	47.95
Superscript 64	46.95

TIMEWORKS

Data Manager 128	$42.95
Data Manager II	29.95
Partner 128	42.95
Swift Calc 128 w/Sideways	42.95
Swift Calc 64 w/Sideways	29.95
Word Writer 128 w/Speller	42.95
Word Writer 64 w/Speller	29.95

NEW RELEASES

Partner 1 2 8	43.95
Ace	14.95
Graphic Expander	21.95
Murder on the Mississippi	21.95
Where in the World is Carmen Sandiago	21.95
World Games	24.95
Top Gunner	16.95
Mercenary	17.95
Hacker II	21.95
Battlefront	26.95
The Infinity Machine	15.95
Ace of Aces	17.95
Ninja	7.95

DIGITAL SOLUTIONS

Pocket Filer 128	$31.95
Pocket Filer 64	24.95
Pocket Planner 128	31.95
Pocket Planner 64	24.95
Pocket Writer 128	31.95
Pocket Writer 64	24.95

MICROPROSE

Conflict in Vietnam	$24.95
Crusade in Europe	24.95
F-15 Strike Eagle	21.95
Silent Service	21.95

SPRINGBOARD

Clip Art I	$20.95
Clip Art II	24.95
Newsroom	30.95
Graphic Expander	21.95

ACCESS

Leader Board	$24.95
Leader Board Tournament Disk	14.95
Mach 128	30.95
Mach 5	21.95

ELA

Bard's Tale	$24.95
Lords of Conquest	24.95
Movie Maker	24.95
Chessmaster 2000	26.95
Mind Mirror	21.95
Ultimate Wizard	19.95

HOT SELLERS

Geos	$37.95
Commando	21.95
Koala Pad	42.95
Koala Printer Utility	16.95
Print Shop Companion	21.95
Int'l Hockey	16.95
Kung Fu II	19.95
Gato	19.95
Fontmaster II	31.95
Ultima III & IV ea	32.95
Super Bowl Sunday	19.95
Super Bowl 1985 Teams	12.95

FIREBIRD

Elite	$18.95
Colossus Chess IV	21.95
Frankie Goes To Hollywood	21.95
Music Systems	24.95
Advance Music Systems	49.95

ACTIVISION

Alter Ego	$29.95
Cross Country Road Race	19.95
Mindshadow	19.95
Murder on the Mississippi	21.95

ACCESSORIES

WICO Boss Joystick	$11.50
WICO Bat Handle Joystick	15.50
WICO Three Way Joystick	18.95
Kraft Joystick	6.95
Xetek Graphic Interface	54.95
Xetek Graphic Jr	34.95
RS 232 Interface	34.95
1200 Baud Modem	99.95
Master Modem	34.95
Flexidraw Light Pen	CALL
Disk Notcher	5.95
AICP Disks (10)	7.95
Drive Cleaner	7.95
Printer Head CLeaner	7.95
Disk Storage Case (50)	7.95

SPECIAL SAVINGS
FREE
PRINTER HEAD CLEANER KIT
with every
RIBBON ORDER

BATTERIES INCLUDED

Consultant 64/128	$39.95
Paper Clip 64/128	39.95
Paper Clip w/spell 64/128	49.95

ACCOLADE

Dambusters	$18.95
Fight Night	18.95
Hard Ball	18.95
Law of The West	18.95
PSI 5 Trading Comp	18.95

SUBLOGIC

Flight Simulator II	$34.95
Football	27.95
Jet	27.95
Scenery Disks 1-6	14.95 ea
Pure Stat Baseball	34.95

KOALA

Koala Pads 64	$42.95
Koala Printer Utility	16.95
Programers Tool Kit	24.95

MINDSCAPE

Bop and Wrestle	$18.95
Infiltrator	18.95
Halley Project	24.95

EPYX

Fast Load	23.95
Multiplan 64/128	40.95
Programmers Tool Kit	27.95
Vorpal	21.95
World Karate Championship	18.95
Worlds Greatest Baseball	23.95
Super Cycle	24.95
World Games	24.95
Worlds Greatest Football	24.95

COMMODORE HARDWARE

C-128	CALL
C-1571	CALL
C-1902A	CALL
C-1670 Modem 1200	CALL
C-1350 Mouse	CALL
64 C	CALL
1541 C	CALL

2 Games In One

Gerry The Germ/ Microcosm	13.95
Willow Pattern Chimera	13.95
UnderWurlde Sabre Wulf	13.95
Booty/Cylu	13.95
Runestone/The Helm	13.95
Chicken Chase/Rasputin	13.95
Battle of Britian Battle for Midway	13.95
ARC of Yesod Nodes of Yesod	13.95

AMIGA SOFTWARE

Borrowed Time	$27.95
Hacker	27.95
Mindshadow	27.95
Music Studio	37.95
Aegis Animator w/Images	89.95
Aegis Draw	124.95
Archon	29.95
Deluxe Paint	72.95
Skyfox	29.95
Rogue	24.95
Temple of Apshai Trilogy	24.95
Master Type	24.95
Halley Project	29.95
Racter	32.95

SSI

Battle Of Antietam	$29.95
Carrier Force	36.95
Kampfgruppe	36.95
Phantasie II	24.95
Rings of Zelphin	24.95
Wings of War	24.95
Wizards Crown	24.95

Solid State Software

VizaStar 128	$79.95
VizaWrite 128	59.95

GREAT GIFT IDEA
Buy 2 Packs of AICP Disks
Receive A
FREE
Disk Storage Case
store 50 disks

CALL US 1-800-634-AICP TOLL FREE

EXTENDED HOLIDAY ORDERING HOURS
10AM TO 8PM E.S.T ORDERS ONLY

Customer Service
718-351-1864
10AM to 6PM
E.S.T.

AMERICAN INTERNATIONAL COMPUTER PRODUCTS
P.O. Box 1758
Staten Island, N.Y. 10314

ORDER INFO

In stock items shipped within 24 hours for prepaid orders (cert. check, visa, m/c) C.O.D. orders accepted, please add $4 00, must be cash or cert check ONLY. NY State Residents add 8¼% sales tax. Advertised prices reflect a 4% discount for cash, credit card add 4%. All orders add $3 50 shipping and handling within the Continental U.S. International orders add $15.00 + shipping & handling. Personal checks allow 2 wks. for clearance. Availability and Pricing subject to change without notice. Orders over $150.00 receive free shipping in Continential U.S. School inquiries invited. Make all checks payable to American International Computer Products. DEFECTIVE EXCHANGES ONLY. REQUIRE RETURN AUTHORIZATION NUMBER

Are you a Consistent BLACKJACK $$$ WINNER$$$?
Be SURE You Have a $$$ Winning $$$ System
BEFORE Wagering!

♠ ♦ ♣ ♥

BLACKJACK ANALYZER

The Ultimate BLACKJACK System ANALYZER &
DEVELOPMENT Program for the C-64 (disk)
(For the SERIOUS BlkJck Player - not a Game)

use BLACKJACK ANALYZER to —

- Test, Analyze, & Improve Current Systems
- DEVELOP Your Own Winning System
- Provide Complete STATISTICAL PRINTOUT of All Playing & Betting System results
- PRACTICE PLAY Current or Developed Systems and Flawlessly learn the System.

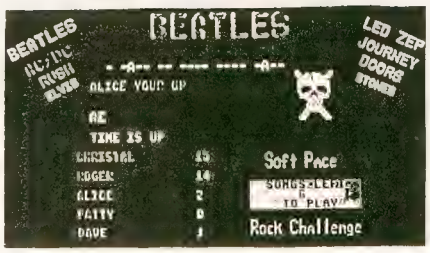
BLACKJACK ANALYZER

Play Thousands of Hands Per Hour AUTOMATICALLY
Indicates System Win/Loss Statistics
Indicates Practice PLAY & BETTING Errors
Records Errors and Correct Play for Printout

ACCOMODATES
TRUE Point Counts - INCREMENTAL Losses/Wins
Incremental Losses or Wins + Point Counts
Card Delete and/or Card Select Analysis
Hit, Stand, Double, Split, Surrender for
all card combinations

$89.50+$3.50 Shpg. & Hdlg *(not copy protected)*
15 Day PREVIEW - $10.00+S & H
If dissatisfied - money back less Preview cost.
THE BEST $10 BET YOU WILL EVER MAKE!

Mail Check, M.O., VISA-M.C. Number & Exp. date
TO: **RJL ENTERPRISES P.O. Box 68118**
Oak Grove, Oregon 97268
TEL. ORDERS: (503) 653-5451



Greatest party game ever! Hundreds of songs in one of the most challenging and fun games out for the Commodore. No two games ever alike! Up to 5 players at a time

With Rock Challenge Group Editor you can add your favorite group's titles and save them to your own data disk. Later when the group comes out with more songs just add them to your data disk

Example You choose to play the Beatles with 35 songs to play. The program chooses one of the over 100 songs and places as a series of dashes. Player 1 guesses a letter in the song, if there he wins a point and continues his turn till he guesses wrong or solves the song for a 5 point bonus

SPECIAL CHRISTMAS ORDER

Rock Challenge & U.S. Greatest Hits Data disk, for only $6.66!

That's right, both disks for only $6.66! We must receive your order by December 20th for this special price. Every 25th order will also be shipped 25 DSDD disks FREE. This offer will not be seen again, so order today. We will ship same day. If you don't agree you have gotten the best offer you have ever seen, then return the disks within 10 days for a full refund! We want every C-64 and 128 user to *Party Hardy with Beatles Challenge*

Send check or money order to:

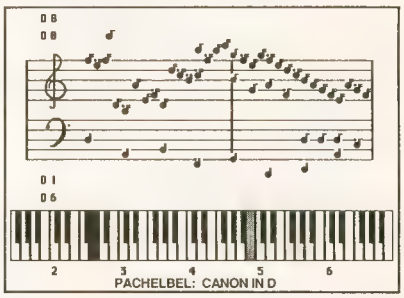
SoftPace Software Co.
P.O. BOX 788
Brea, CA. 92622-0788
We ship same day!
SOLD ON DISK ONLY

"Awesome...Professional"
-Stan Jones, Fairbanks News Miner

CLASSICAL MUSIC DISKS

3 HOURS OF MUSIC only **$19.95!**

Virtuoso performances with every note shown simultaneously on staff and keyboard. Many pieces accompanied with words. Play any portion, change instruments, key and tempo to suit your taste. Select from 9 instruments or create your own. Music can be programmed to play for hours at a time. Never has so much been offered for so low a price, and with satisfaction guaranteed.



Contains many complete works, including Beethoven's Waldstein sonata, several Mozart sonatas, Bach's Brandenburg Concerto No. 3 and Fugue in D minor, Chopin's Fantaisie Impromptu, Handel's Messiah, plus pieces by Debussey, Couperin, Albeniz, Christmas carols, and more.

For Commodore 64™ and 128™ computers. $19.95 plus $2.00 shipping. COD and Canadian checks accepted. Orders shipped immediately via first class mail.

15-DAY MONEYBACK GUARANTEE

Also available: EUPHONY, the powerful music processor used to create our music disks. Our customers call it the best on the market. For intermediate to advanced music students and programmers. About $25. Write for details.

TCO SOFTWARE

P.O. Box 81504, Fairbanks, AK 99708
907-479-4898

Precision Data Products™ Complete Line of Quality Supplies for Your Computer

LOOK WHAT YOU GET *FREE*

Order 100 or more 3M Branded 5¼" or 3½" Diskettes (10/Box) receive a coupon redeemable for

***FREE* 3M DATA DEFENDER DISKETTE STORAGE TRAY**
$26.95 Value
(Does not apply to Highland Diskettes)

3M DISKETTES

5¼" Diskettes
SSDDRH ..... **$ .76 Each**
DSDDRH ..... **$ .97 Each**
DSHD96TPI ... **$2.17 Each**

3½" Diskettes
SS MICRO .... **$1.32 Each**
DS MICRO .... **$1.76 Each**

3M DATA CARTRIDGES

DC1000 ..... **$12.50 Each**
DC600A ..... **$20.85 Each**
DC300XL/P ..... **$18.95 Each**
Shipping and Handling $3.00/5 data cartridges.

Order 10 or more Data Cartridges receive a coupon redeemable for

***FREE* DATA CARTRIDGE DESKTOP STORAGE FILE up to $24.95 Value**

Discounts on Larger Quantities

Min. Order $25.00. S&H: Continental USA $4.00/100 or fewer disks. Reduced shipping charge on larger quantities. Foreign orders, APO/FPO, please call. MI residents add 4% tax. Prices subject to change without notice. Hours: 8:30 AM - 7:00 PM ET.

Precision Data Products™
P.O. Box 8367, Grand Rapids, MI 49518
Customer Service & Information
(616) 452-3457
Toll-Free Order Lines
MI 1-800-632-2468/Outside MI 1-800-258-0028

COMPUTE!'s Gazette Subscriber Services

Please help us serve you better. If you need to contact us for any of the reasons listed below, write to us at:

COMPUTE!'s Gazette
P.O. Box 10957
Des Moines, IA 50340

or call the Toll Free number listed below.

Change of Address. Please allow us 6–8 weeks to effect the change; send your current mailing label along with your new address.

Renewal. Should you wish to renew your Gazette subscription before we remind you to, send your current mailing label with payment or charge number, or call the Toll Free number listed below.

New Subscription. A one-year (12-month) U.S. subscription to *COMPUTE!'s Gazette* is $24 (2 years, $45; 3 years, $65. For subscription rates outside the U.S., see staff page). Send us your name and address or call the Toll Free number listed below.

Delivery Problems. If you receive duplicate issues of *COMPUTE!'s Gazette*, if you experience late delivery, or if you have problems with your subscription, please call the Toll Free number listed below.

COMPUTE!'s Gazette
1-800-247-5470
In IA 1-800-532-1272

LOTTERY 64
LOTTERY +4

NOT WINNING WITH YOUR SYSTEM?
TRY OURS!

WE'VE ALREADY WON THOUSANDS
WITH IT AND WE'RE STILL WINNING!

LOTTERY has been designed to use the computing power of the COMMODORE computer to help you play the various lottery games: PICK 3, PICK 4, LOTTO, SUPER LOTTO, 6/49, LUCKY LOTTERY, etc. It can be used with any lottery game in which you pick the numbers.

AVAILABLE ON DISKETTE ONLY.
SPECIFY 64/128 or PLUS/4

To order, send $24.95 for each plus $3.00 postage and handling per order to:
(Illinois residents add 6% sales tax)

MasterCard VISA

C.O.D. orders call: (312) 566-4647

Superior Micro Systems, Inc.
P.O. Box 713 • Wheeling, IL 60090
Dealer inquiries welcome!

MONTGOMERY GRANT

115 Nassau St. Between Beekman & Ann Sts. NYC (212) 732-4500
open Mon-Fri: 8:30am – 6:30pm Sat: 9:30am – 6pm Sun: 9:30am – 5:30pm

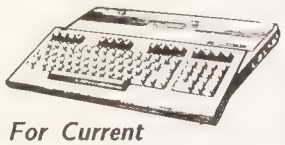
Penn Station/Amtrack Level Beneath Madison Sq. Garden, NYC
(212) 594-7140 open Mon-Fri: 8:30am – 9pm Sat. & Sun: 9:30am – 7pm

PHONE and MAIL ORDERS ONLY
Call Collect
(212) 594-7140

ALL COMPUTERS & PERIPHERALS COME COMPLETE WITH AC ADAPTOR, OWNER'S MANUAL AND ALL CONNECTING CABLES.

ALL MERCHANDISE IS BRAND NEW AND FACTORY FRESH, COMPLETE WITH MFR. U.S.A. WARRANTY.

commodore C128

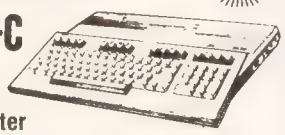


128 K RAM Powered Personal Computer

Call For Current Low Price

commodore 64-C

NEW

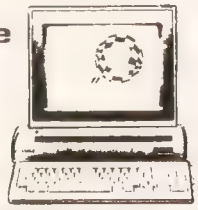


64 K RAM Powered Home Computer

1541–c Disk Drive... *Call*

Call For Current Low Price

commodore AMIGA



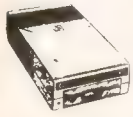
512 K RAM Powered Computer System

CALL FOR CURRENT LOW PRICE!

PERIPHERALS

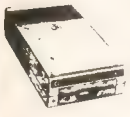
AMIGA 1080 High-Resolution Monitor

$269.95



1541 Disk Drive

$149.95



1571 Disk Drive

Call For Current Low Price

1702 Computer Monitor

$149.95

1902 RGB Color Monitor

Call For Current Low Price

C-16 16K Computer.....$39.95

commodore COMPUTER PACKAGES

Get it all together & save!

C64 STARTER PACKAGE

- C-64 Computer
- Computer Cassette Drive
- Computer Printer
- 12" Monitor

$259.95

C64 COMPLETE PACKAGE

- Commodore 64 Computer
- Commodore 1541 Disk Drive
- 80 Column Printer
- 12" Computer Monitor

$399.95

C128 COMPLETE PACKAGE

- Commodore 128 Computer
- Commodore 1541 Disk Drive
- 12" Computer Monitor
- 80 Column Printer

$529.95

TO SUBSTITUTE 1571 for 1541 ADD $70

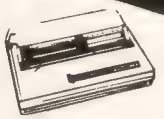
C128 DELUXE PACKAGE

- Commodore 128 Computer
- Commodore 1571 Disk Drive
- Commodore 1902 Color Monitor
- Commodore 80 Column Printer

$789.95

GEOS Program $39.95

COMPUTER PRINTERS



commodore MPS-803 Printer **$99.95**

MPS-1000 Printer ..... *Call*

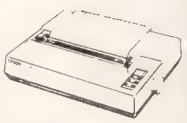
star

SG-10C 120 CPS High Speed Printer **$209.95**

STAR NX-10 Printer..... $229
STAR Gemini II Printer $229

STAR Power Type Daisy Wheel Letter Quality Printer **$249.95**

EPSON LX-80 High Quality Printer **$229.95**



OKIMATE 10 Color Printer with Plug 'n' Print **$159.95**

Okimate 20 w/Plug 'n' Print.....$189.95

PERIPHERALS

1660 Phone Modem **$45.95**

1670 Automodem.... $155

1350" "Mouse" for any Commodore Computer **$45**

1700 128 K Expansion Module $99

80 Column Display Card for Commodore 64..... $69.95

1750 512 K Expansion Module . $169
"MAGIC VOICE" Module ... $49.95

Memorex 5 1/4" Floppy Disks. Box 10..$8.95

Certified check, bank check, Mastercard, Visa, Amex, Diner's Club and Carte Blanche accepted. Non-certified checks must wait for bank clearance. NY residents add 8-1/4% sales tax. Prices and availability subject to change without notice–so call before placing your order. Not responsible for typographical errors. Returns of defective merchandise must have prior return authorization number.

BLUE BOARD BBS super fast

While Blue Board is the fastest bulletin board you can buy for the Commodore 64/128, that's only one reason why it's the most popular bulletin board system ever! SYSOPs love the ability to craft a unique board that's an expression of their own personality and the envy of other SYSOPs. Users love Blue Board's power-packed on-line functions that really let them get the message across, or just plain have fun! Here are just a few of the features that await you:

•

SYSOP definable system messages and menus • up to 20 sub-boards • full featured user editing • built in terminal program • over 200 users • over 200 messages • "scribble" section • voting section • XMODEM & ASCII file transfer available with 2 drives. • 300/1200 baud • get the board that gives you *complete control!*

•

Blue Board runs on a C64 or C128 (C64 mode), requires one or two 1541 or 1571 drives and a 1550, 1560, 1570 or Hayes 300 or 300/1200 baud compatible modem.

$69.95 US funds

Price includes shipping • additional charge on purchase orders.
FOR MORE INFORMATION WRITE OR CALL:

SOTA Computing Systems Limited

See Blue Board in action - call (604) 683-1914

213-1080 Broughton Street
Vancouver, B.C.
Canada • V6G 2A8
PHONE: (604) 688-5009

Mail Orders: Check, M.O., Visa or MasterCard

FREE? DISKETTES

SAVE MONEY! C64 and VIC 20 users can use the diskette flip side, if another 'write enable' notch is correctly made.

TOP NOTCH™ by QUORUM quickly **solves** that **problem.** It's like FREE DISKETTES!

- Stainless Steel Guide
- Easy Leverage Handle
- Clippings Catcher
- Square Notch Cut

Lifetime Warranty

TOP NOTCH™ Just $14.95

Add $2.00 s/h • CA Res. add 97¢ tax

It's the Top-Notch Notcher!

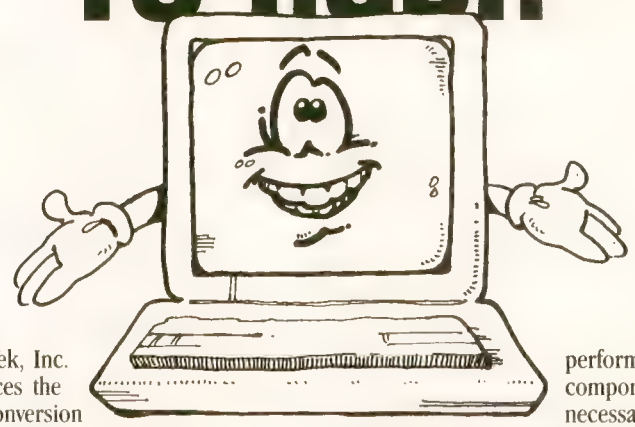
CALL TOLL FREE
1-800-222-2824
In CA: 1-800-222-2812
8-5pm PST

Visa/MC

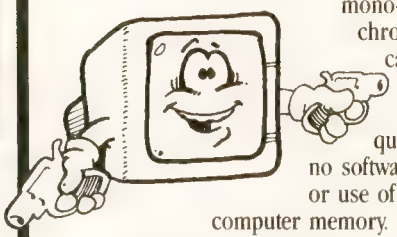
QUORUM INTERNATIONAL, Unltd.
INDUSTRIAL STATION P O BOX 2134-GZ
OAKLAND, CA 94614

To receive additional information from advertisers in this issue, use the handy reader service cards in the back of the magazine.

CONVERT YOUR COMPOSITE MONITOR TO RGBI!



DigiTek, Inc. introduces the RGBI Conversion System! Now you can convert your 1702 composite monitor* to true, 100%, full color RGBI (all three guns driven separately)! With the flip of a switch go to composite or RGBI. This is not an emulation of RGBI or a monochrome cable and requires no software or use of computer memory. With our conversion system your composite monitor IS an RGBI monitor.



Enjoy the full potential of your C128 - use of the 80 column mode, the high resolution mode and the full 2 MHZ speed. All this with a picture quality that equals any factory built RGBI monitor (but for a fraction of the price)!

Our conversion system is a hardware add-on and requires minor assembly. The system comes complete with detailed instructions for converting your monitor. Our conversion process is simple and easy to perform. All components necessary for assembly are included. For those requiring additional assistance we have provided a technical support number to call. We are firmly committed to customer support.

So don't wait any longer — get the full use of your monitor — convert it to RGBI with DigiTek, Inc.'s RGBI Conversion System! Just send $49.95 plus $3.50 for postage and handling.

For more information or to place your order call our customer service line at (813) 933-8023, or write to: DigiTek, Inc., 10415 N. Florida Ave., Suite 410, Tampa, Florida 33612.

There is a $5.00 additional charge for C.O.D. orders. Dealer inquiries welcome.

*Conversion available for all composite monitors, write or call for further information.

DigiTek, Inc.

10415 N. Florida Ave, Suite 410
Tampa, Florida 33612

(813) 933-8023

Classified

SOFTWARE

FREE SOFTWARE for C64, C128, IBM, & CPM
Send SASA for info (specify computer) to:
PUBLIC DOMAIN USERS GROUP,
PO Box 1442-A2, Orange Park, FL 32067

C64 FINEST PUBLIC DOMAIN PROGRAMS
On Disk most $1.50 *On Disk free list
You pick the programs you want!!!
JLH Co., Dept G, Box 67021, Topeka, KS 66607

FREE MEMBERSHIP IN SOFTWARE CLUB.
Top British C64 programs. Catalog and reviews (no strings). ARROW EXPRESS,
Box 205 G8, Rossland, BC VOG 1Y0

$$ WIN WITH THOROUGHBRED, HARNESS & GREYHOUND handicapping software: $29.95, enhanced: $49.95. For most computers.
Free info. Software Exchange, Box 5382 CG,
W. Bloomfield, MI 48033. (313) 626-7208

DFC-DISKETTE FILE COPY, version 4.0
Convenient File utility for C64.
No copy protect. Now with support for SFD 1001, 8250, & 1571. Still supports 1541, 4040, 2031, & 8050. (Not for protected disks.) Ideal for IEEE 488 & other interfaces. Put the files you want on the diskettes you want.
Send no money for 10-day free trial.
Then pay $12.95 + $1.50 for shipping (Continental US) or send $12.95 with the order and forget the shipping.
California orders must add sales tax.
No credit cards or COD.
Layton Berry Software, (415) 284-7255,
573 Merriewood Dr., Lafayette, CA 94549

MUTUAL FUND PROSPECTOR for C64-$49.95
Be your own investment advisor.
Send SASE for information. Aspen Glen Software, 878 Jackman St., Suite 157,
El Cajon, CA 92020 (619) 447-5999

FREE CATALOG...Programs for C64 & C128.
Personal, Creative, Utilities, Games!
Hurry! Christmas is coming! Write to:
M-WARE, 22704 Ventura Blvd. #1225,
Woodland Hills, CA 91364

PRO FOOTBALL ANALYST. BEAT THE POINT SPREAD! Only 5 min per week & your local newspaper is all it takes to find hidden overlays in the betting line. Winning season GUARANTEED! IBM/C64/TI99-$34.95 (+$4.55 s/h) ORDER NOW! 1-800-341-1950 ex 77. Mail Orders: RIDGE, 170 Broadway #201-C, NYC, NY 10038. Catalog

---

LOTTO PICKER. Improve your chances for those Million $ Jackpots! Picks LOTTO, WIN-4 and Daily Numbers. All US & CAN games incl'd. Expandable! IBM/C64/TI99: $29.95. Order Now! 800-341-1950 ex 77. Mail Orders: Ridge, 170 Broadway #201C, NY, NY 10038. Catalog

---

C64 FINEST PUBLIC DOMAIN PROGRAMS
On Disk most $1.50 *On Disk*
Free List! You pick the programs you want!!!
JLH Co., Dept G, Box 67021, Topeka, KS 66607

ALMOST FREE SOFTWARE: Excellent PD software. 15 prog/$25. Send SASE for FREE catalog. Box 37, Bath, NH 03740.
Looking for new PD progs for IBM & Comm.

FREE CATALOG. Lowest priced public domain software available for your C64 and C128.
We pay shipping. Send to: M&M SOFTWARE,
P.O. Box 3111, Terre Haute, IN 47803

FREE! AMAZING MODEM FUN!!
CALL**FANTASY PLAZA**TODAY!
1-818-840-8066 (300 BAUD MODEM)
YOU WILL BE VERY IMPRESSED!

COLORFUL VIDEO TITLE MAKER AND STORE ADVERTISING SOFTWARE USES YOUR PRINT SHOP (TM) FONTS AND DESIGNS...
$14.95 (C64 disk) MicroAds, 145 EAST NORMAN DR., PALATINE, IL 60067

YUPPIE INDEX! ESTIMATE COST-BENEFITS
of objectives and success! Do a market analysis of yourself and competition.
C64 Disk $29.95. Order from IV-ER,
239 Irving St., Falls Church, VA 22046

FASTFILE C64/128 for Home/Business.
Customers say, "It's the best I've seen! It's easy to learn, easy to use, won't hurt my drive, allows backups, and is 100 to 1000 times FASTER than popular databases!"
Try FASTFILE with report for 15 days.
If you're not satisfied we'll refund 85% of purchase. Send $59.95 + $4 s/h (WA res. add 7.8% and foreign $4 US) to:
IMS Inc., 5312 W. Tucannon, Kennewick, WA 99336. VISA/MC, Check, MO (509) 783-3829

If you'd like information on the latest version of your software, please call or write:
Batteries Included Customer Support, 30 Mural St., Richmond Hill, Ontario, Canada L4B 1B5
(416) 881-9816

C64 Digitally Recorded Sound Library
4 disk sides of sound effects to use in your programs. Send $25 to: Eric Beckett,
8619 S. Sharon Dr., Oak Creek, WI 53154

**** JEOPARDY & WHEEL OF FORTUNE ****
2 GREAT GAMES, 1 LOW PRICE...ONLY $13.95
C64/128 DISK ONLY. PANTHER SOFTWARE,
5425-M ALBEMARLE RD., CHARLOTTE, NC 28212

NEW +4 and C128 SOFTWARE
Games, educational, finance statistics.
Write for info. CARDINAL SOFTWARE, 14840 Build America Dr., Woodbridge, VA 22191

HEBREW, RUSSIAN, GREEK, JAPANESE word processors. Also create your own Char. sets!
C64/128 - $29.95; IBM-PC - $69.95. Send check to ISRACOMP, P.O. Box 1091, King of Prussia, PA 19406

SAMPLE C64 DISK: 20 PROGS?DETAILS FREE.
Send $2.95 ch/mo for p/h to:
Software Exchange Group
12610 Central Ave., Ste. 206, Chino, CA 91710

HEY AMIGO! P.D. SOFTWARE FOR AMIGA. GAMES, Graphics, Utilities & More! Over 25 Disks. Only $5.95 each! SASE for Catalog:
AMYWARE, P.O. Box 19474, Jacksonville, FL 32245

Educational C64 games teach kids to read music. Send for free brochure.
Electric Beethoven, 4638 Van Noord Ave.,
Dept. G, Sherman Oaks, CA 91423

64/128/64C, MATURE SOFTWARE!!!
Send $1 & SASE, refundable with order, for catalog to: K-RAM, P.O. Box 186,
South Lebanon, Ohio 45065-0186

CANADA, mail order software, peripherals large selection, popular titles, low price.
Free info and price list: CANSOFT,
Box 3464, Dept. G, Courtenay, BC V9N 5N5

COMMODORE: TRY BEFORE YOU BUY.
Best selling games, utilities, educational + classics and new releases. 100's of titles.
Visa/MC. Free brochure. RENT-A-DISC, Frederick Bldg. #345, Hunt'n, WV 25701 (304) 529-3232

ARB BULLETIN BOARD FOR THE 64 & 128
300–1200 Baud, Punter/Xmodem/ASCII, Vote, War Room, Quiz, 27 SIGS, Passwords, E-Mail, Dating Board & More! $64.95
(BBS) 718-645-1979 * (Voice) 718-336-2343
L&S Computers, P.O. Box 392, Bklyn, NY 11229

HARDWARE

WANTED DEAD OR ALIVE
C64 COMPUTERS, 1541 DRIVES, ETC, ETC...
ANY CONDITION WORTH $$$
CALL NOW! 305/685-6747.

MISCELLANEOUS

New! Bulletin Board Listings!
Put your MODEM to good use with the most up-to-date NATIONWIDE BBS listing. Send $3.75 to CJ Innovations, Dept. C2, P.O. Box 6, Garnerville, NY 10923

SAVE MONEY ON SPEED OR ALIGNMENT adjusting on C1541 with VIDEO instruction!
VHS: $79.95 ea. to R. REESE, 2115½ Dana St. #A, Anaheim, CA 92802 (714) 750-1850

BBS CONSTRUCTION KIT 128 & 64 modes - Make your own fantastic BBS! $51.50 for 64, $71.50 for 128. For more info write: Powersystems, P.O. Box 822, Coventry, RI 02816 BBS 401-822-4605. Dealers Welcome!

COMPUTE!'s Gazette Classified is a low-cost way to tell over 275,000 microcomputer owners about your product or service.

Rates: $25 per line, minimum of four lines. Any or all of the first line set in capital letters at no charge. Add $15 per line for boldface words, or $50 for the entire ad set in boldface (any number of lines.) Inquire about display rates.
Terms: Prepayment is required. Check, money order, American Express, Visa, or MasterCard is accepted. Make checks payable to COMPUTE! Publications.
Form: Ads are subject to publisher's approval and must be either typed or legibly printed. One line equals 40 letters and spaces between words. Please underline words to be set in boldface.
General Information: Advertisers using post office box numbers in their ads must supply permanent address and telephone numbers. Orders will not be acknowledged. Ad will appear in next available issue after receipt.
Closing: 10th of the third month preceding cover date (e.g., June issue closes March 10th). Send order and remittance to: Harry Blair, Classified Manager, COMPUTE!'s Gazette, P.O. Box 5406, Greensboro, NC 27403. To place an ad by phone, call Harry Blair at (919) 275-9809.
Notice: COMPUTE! Publications cannot be responsible for offers or claims of advertisers, but will attempt to screen out misleading or questionable copy.

advertiser's index

Reader Service Number/Advertiser	Page
102 Abacus	83,84
103 Abby's Discount Software	153
104 Acorn of Indiana	162
105 ActionSoft	37,38–39
106 Activision, Inc.	4
107 Activision, Inc.	53
108 Activision, Inc.	57
109 Activision, Inc.	71
110 Activision, Inc.	81
111 American International Computer Products	163
112 Aprotek	157
113 Artificial Intelligence	162
114 Atari Corp.	97,107,111
115 The Avalon Hill Game Company	58
116 Banana Software, Inc.	148
117 Basix	85
Batteries Included	1
Batteries Included	69
118 Berkeley Softworks	18–19
119 Berkeley Softworks	20–21
120 Bible Research	97
121 Blackship Computer Supply	160
122 Bodylog, Inc.	48–49
123 CAPPCO	150
124 Cardinal Software	107
125 Central Point	90
126 Cheatsheet Products, Inc.	159
C.O.M.B. Direct Marketing	152,158
127 Compumed	150
128 CompuServe	2–3
129 ComputAbility	144,145
130 Computer Centers of America	147
131 Computer Mail Order	113–120
132 Computer Mart	148
133 Computer Place	154
134 Covox, Inc.	150
Crown Custom Covers	162
135 CSM Software, Inc.	78
136 Data East USA, Inc.	79
137 db Software	92
138 Digital Solutions, Inc.	160
Digital Solutions, Inc.	BC
139 Digitek Inc.	166
140 Disk-Of-The-Month Club	154
141 DJ Software	160
142 Electronic Arts	IFC
143 Electronic One	161
144 Emerald Component International	156
145 Enlightenment, Inc.	105
146 EPYX	33
147 EPYX	47
148 EPYX	109
FasTec, Inc.	156
149 Federal Hill Software	109
150 Firebird Licensees Inc.	15
151 Firebird Licensees Inc.	41
152 Free Spirit Software, Inc.	160
153 Future Music	160
154 GSR Software	162
155 HesWare	91
156 HesWare	93
157 Infocom	42–43
Intelligent I/O	160
Intelligent Software	154
158 Jason Ranheim	146,154
159 Ketek	59
KSoft	156
Lyco Computer	54–55
160 Maxtron	162
161 Micro Arts Products	162
162 MicroComputer Services	146
163 Micro Prose Simulation Software	23
164 Micro Prose Simulation Software	77
165 Micro-Sys Distributors	158
166 Micro Distributing, Inc.	148
Mindscape	12–13
167 Montgomery Grant	165
NRI Schools	103
168 Okidata	7
169 Okidata	67
170 Origin Systems, Inc.	IBC
171 Precision Data Products	164
172 Pro-Techtronics	74–75
173 Protecto	61,62,63
174 Quorum International, Unltd.	166
175 RJL Enterprises	164
176 S&R Marketing	152
Schnedler Systems	91
Second Source Engineering	80
177 Signal Computer Consultants	112
178 Silicon Express	87
179 Skyles Electric Works	149
180 SoftPace Software Co.	164
181 Software Discounters of America	151
182 SOTA Computing Systems Limited	166
183 Star Micronics	99
184 Strategic Simulations, Inc.	51
185 subLOGIC Corporation	11
186 subLOGIC Corporation	31
187 subLOGIC Corporation	73
188 Superior Micro Systems, Inc.	164
TCO Software	164
Tektonics Plus, Inc.	93
189 Tenex Computer Express	143
190 tensoft	101
191 Triad Computer	155
192 Tussey Computer Products	26–29
193 Ultrabyte	109
194 Unitech	158
140 Unlimited Software, Inc.	154
195 Wenger Corp.	45
196 Wilanta Arts	101
197 Xetec, Inc.	152

Classified Ads	167
The Complete Desk Top Publisher & I Didn't Know You Could Do *That* with a Computer	35
COMPUTE! Books' New Commodore 64 Releases	44
COMPUTE! Books' New 128 Collection	9
COMPUTE!'s Gazette Disk Subscription	65
COMPUTE!'s Gazette Subscription	17
40 More Great Flight Simulator Adventures	95
Machine Language for Beginners & the Second Book of Machine Language	96

FREE Reader Information Service

Use these cards to request FREE information about the products advertised in this issue. Clearly print or type your full name and address. Only one card should be used per person. Circle the numbers that correspond to the key number appearing in the advertisers index.

Send in the card and the advertisers will receive your inquiry. Although every effort is made to insure that only advertisers wishing to provide product information have reader service numbers, *COMPUTE!'s GAZETTE* cannot be responsible if advertisers do not provide literature to readers.

Please use these cards *only* for subscribing or for requesting product information. Editorial and customer service inquiries should be addressed to: *COMPUTE!'s GAZETTE* P.O. Box 5406, Greensboro, NC 27403. Check the expiration date on the card to insure proper handling.

Use these cards and this address only for *COMPUTE!'s GAZETTE* Reader Information Service. Do not send with payment in any form.

COMPUTE!'s GAZETTE

102	103	104	105	106	107	108	109	110	111	112	113	114	115	116	117	118
119	120	121	122	123	124	125	126	127	128	129	130	131	132	133	134	135
136	137	138	139	140	141	142	143	144	145	146	147	148	149	150	151	152
153	154	155	156	157	158	159	160	161	162	163	164	165	166	167	168	169
170	171	172	173	174	175	176	177	178	179	180	181	182	183	184	185	186
187	188	189	190	191	192	193	194	195	196	197	198	199	200	201	202	203
204	205	206	207	208	209	210	211	212	213	214	215	216	217	218	219	220
221	222	223	224	225	226	227	228	229	230	231	232	233	234	235	236	237
238	239	240	241	242	243	244	245	246	247	248	249	250	251	252	350	

Circle 350 for a one year new U.S. subscription to *COMPUTE!'s GAZETTE*. you will be billed for $24.

Please let us know. Do you own: plan to buy:

- ☐ Commodore 64 ___ ☐ 270 271
- ☐ VIC-20 ___ ☐ 272 273
- ☐ Plus/4 ___ ☐ 274 275
- ☐ Commodore 16 ___ ☐ 276 277
- ☐ Other ___ ☐ 278 279
- ☐ ___ h 280 281

Please print or type name and address.
Limit one card per person.

Name _____

Address _____

City _____

State/Province _____ Zip _____

Country _____

Phone _____

Please Include ZIP Code Expiration Date 1/31/87 GA1286

ORDER A SUBSCRIPTION TO COMPUTE!'s GAZETTE.

For Fastest Service, Call Our **Toll-Free** US Order Line
800-247-5470
In IA call 1-800-532-1272

☐ $24.00 One Year US Subscription
☐ $45.00 Two Year US Subscription

Name _____

Address _____

City _____ State _____ Zip _____

☐ Payment Enclosed ☐ Bill Me
Charge my ☐ Visa ☐ MasterCard ☐ American Express

Account No. _____ Exp. ____/____

Your subscription will begin with the next available issue. Please allow 4-6 weeks for delivery of first issue. Subscription prices subject to change at any time. Outside the U.S.A. please add $6 for each subscription.

J1114

Place
Stamp
Here

COMPUTE!'s GAZETTE Reader Service
P.O. Box 2161
Radnor, PA 19089

NO POSTAGE
NECESSARY
IF MAILED
IN THE
UNITED STATES

BUSINESS REPLY MAIL
FIRST CLASS PERMIT NO. 7479 DES MOINES, IOWA

POSTAGE WILL BE PAID BY ADDRESSEE

COMPUTE!'s GAZETTE
PO BOX 10957
DES MOINES, IOWA 50347

From Origin comes the long-awaited sequel to the award-winning Ultima™ III

Ultima IV

Quest of the Avatar

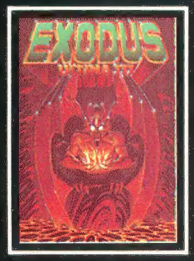
A state-of-the-art fantasy role-playing game of unprecedented magnitude by Lord British™.

Prepare yourself for a grand adventure: Ultima™ IV, sixteen times larger than Ultima III, is a milestone in computer gaming—one that challenges your physical and mental skills while testing the true fabric of your character.

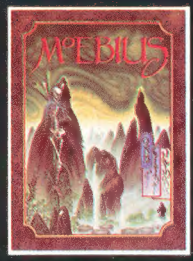
Enter Britannia, kingdom of Lord British. Journey through terrain of infinite proportions, conversing with characters on hundreds of topics. Unravel the mysteries of a superior magic system. At each turn beware of daemons, dragons and long-dead wizards haunting the most tranquil of places. Encounters with parties of mixed enemy types test your strategic abilities. Shrewd use of terrain can lead to victory against seemingly impossible odds.

Survive this multi-quest fantasy, then begin the final conflict, your quest of the Avatar. The ultimate challenge—the self—awaits....

ORIGIN SYSTEMS INC. 340 HARVEY ROAD, MANCHESTER, NH 03103 (603) 644-3360



ULTIMA™ III sends you on an incredible fantasy role-playing journey through monster-plagued Sosaria in search of the elusive Exodus.



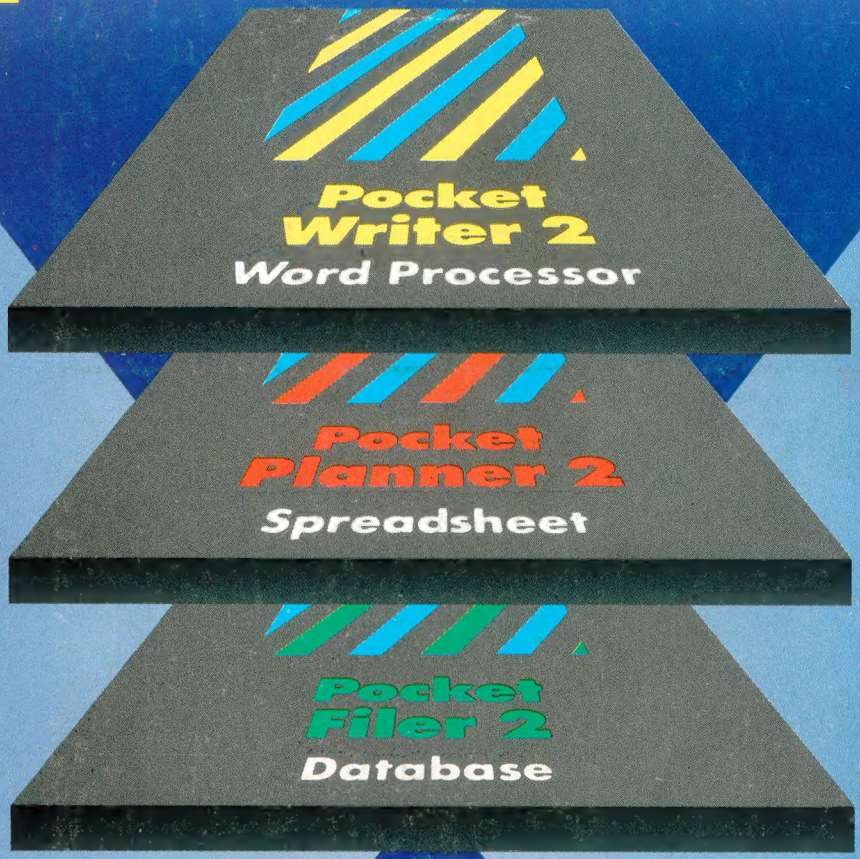
MOEBIUS™ takes you through the elemental planes of a colorful Oriental world of fantasy and adventure in search of the Orb of Celestial Harmony.

AUTODUEL™ is a futuristic, fast-paced strategy role-playing game where the right of way goes to the biggest guns.

OGRE™ is a strategy game fought on the nuclear battlefield of tomorrow as an inhuman juggernaut Cybertank battles conventional forces.

Ultima and Lord British are trademarks of Richard Garriott/Moebius is a trademark of Greg Malone/AutoDuel and Ogre are trademarks of Steve Jackson/Apple is a trademark of Apple Computer Inc/Previous Ultimas are not needed to enjoy Ultima IV **Authors wanted. Call us today.**

Super Solutions 2



The Best Just Got Better

We just did something only the best can do! We made our award winning* software for the Commodore™ 128 and 64 computers even better!

Introducing...Pocket Writer 2/word processor **Pocket Planner 2**/spreadsheet **Pocket Filer 2**/database

Our new Pocket 2 series offers features usually found only in much more sophisticated applications software. Features that include: compatability with the new GEOS operating system†, ability to work with the Commodore RAM expander to allow a RAM disk, mouse support with pull down menus, 1571 burst mode for faster file loading, increased support for two single disk drives, automatic configuration for screen color, format and printer selection†.

Sophisticated software, yes, and still easy to use. You can be up and running in under 30 minutes even if you haven't operated a computer before.

Now, when you upgrade your Commodore™ 64 to a 128, Pocket software helps make it a breeze. The new Pocket 2 software has both 128 and 64 applications on the same disk. So when you buy one you are actually buying two software packages. The cost only $59.95 (U.S.).

Serious Software That's Simple to Use

You can buy all three Pocket 2 applications, Pocket Writer 2, Pocket Planner 2 and Pocket Filer 2 in one convenient Superpak for the low price of only $99.95 (U.S.). A super way to discover all the integrated features of Pocket 2 software and save almost eighty dollars.

As a companion to Pocket Writer 2, a **Dictionary Disk** containing 32,000 words (expandable to 40,000) is available. The cost $14.95 (U.S.).

For those of you who have already discovered the many benefits of owning Pocket software; we offer all registered owners upgrade Pocket 2 software for only $19.95 (U.S.) plus 3.00 (U.S.) shipping and handling! Available only by writing to Digital Solutions Inc.

*Commodore's Micro-computers Magazine, independent reviewers, rated the original Pocket Writer 128/64 and Pocket Planner 128/64 software the "Annual Best of 1986" in the productivity category.

International Distributor Enquiries to:

Digital Solutions Inc.

2-30 Wertheim Court
Richmond Hill, Ontario
Canada L4B 1B9
Telephone (416) 731-8775
Telex 06-964501
Fax (416) 731-8915

Superpak: The Solution That Saves Money!

Economical; $179.85 (U.S.) worth of software for only **$99.95 (U.S.)**

Canadian Dealer Enquiries:
Ingram Canada Ltd.
1-416-738-1700

Mail orders:
Crystal Computer Inc.
in Michigan
1-517-224-7667
outside Michigan
1-800-245-7316

Commodore is a registered trademark of Commodore Business Machines Inc.
†Features available for Commodore 64™
©1986 Digital Solutions Inc.

Made with love by

RetroMags

20+ Years

Our goal is to preserve classic video game magazines so that they are not lost permanently.

People interested in helping out in any capacity, please visit us at retromags.com.

No profit is made from these scans, nor do we offer anything available from the publishers themselves.

If you come across anyone selling releases from this site, please do not support them and do let us know.

Thank you!